

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metals.

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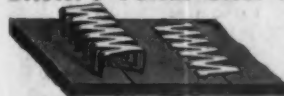
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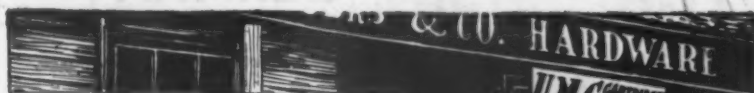
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THE IRON AGE

New York, Thursday, July 20, 1905.

The Ashland Slag Cement Plant.

Built by Ashland Iron & Mining Company.

In an article in *The Iron Age* May 18, 1905, an account was given of the slag cement industry, with the requirements demanded by the United States Government for its use. Slag cement has recently become a subject of great interest to blast furnaces throughout the United States on account of the increased cost of the disposal of the refuse slag. Many of the more progressive furnaces have installed slag cement works in connection with their furnaces to convert what is becoming a serious expense into a profit.

Last summer the Ashland Iron & Mining Company, Ashland, Ky., delegated its superintendent, E. B. Hull, to look into the manufacture of slag cement, and after visiting many of the most important slag cement plants

ing containing the dryers and cement mills, plan and elevation of which are shown in Fig. 2, and is fed through a screen into an elevator hopper. It is then elevated by a bucket conveyor and carried by a screw conveyor to the three Ruggles-Coles dryers, and any surplus carried over is returned to the elevator pit by another screw conveyor underneath the dryers. After passing through the dryers it is conveyed and elevated to a dry slag steel bin, holding about one day's supply.

The lime, which is burned on the ground by a Broomell patent kiln and hydrated at the kiln, is delivered to the plant and fed into a screw conveyor at the west end of the building. From there it is conveyed and elevated by a bucket conveyor to a bin adjoining the dry slag bin. The slag and hydrated lime are then fed by an automatic device, which regulates the proportions of each, into an Allis-Chalmers tube mill, which does the mixing and preliminary grinding. From the first tube mill it is fed to

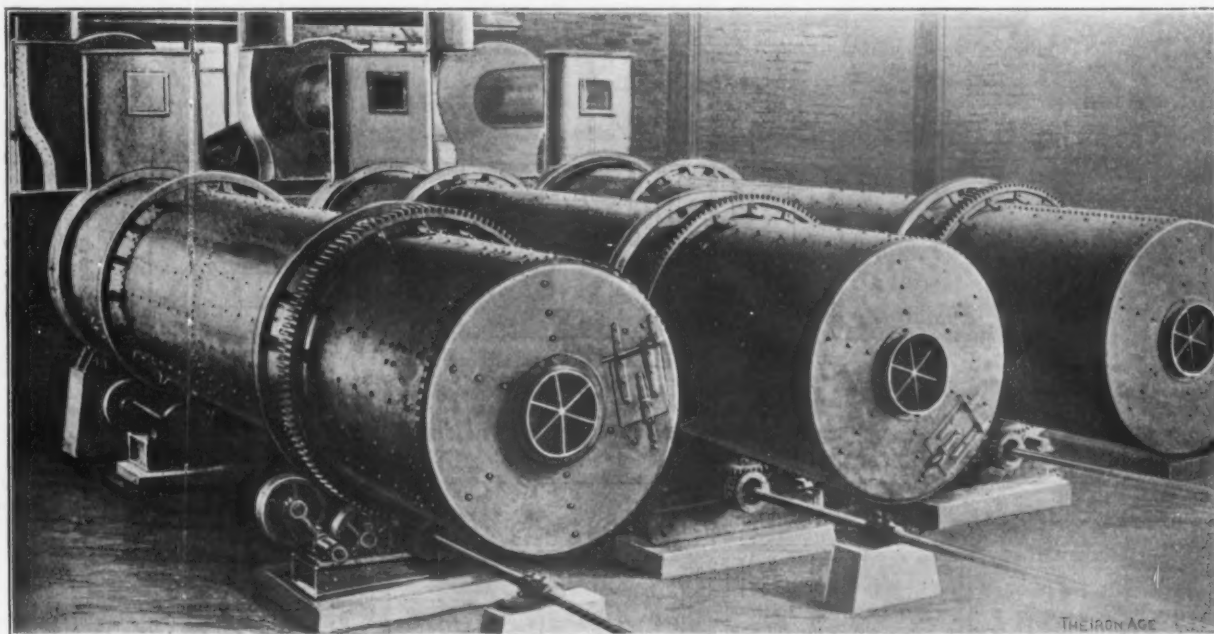


Fig. 1.—View of the Ruggles-Coles Dryers in the Slag Cement Plant of the Ashland Iron & Mining Company, Ashland, Ky.

he recommended that the company engage in its manufacture. A contract was signed with C. J. Curtin, 39 Cortlandt street, New York, last November, for the installation of a plant with a capacity of 500 barrels of slag cement per day. Mr. Curtin associated with him the Ruggles-Coles Engineering Company, New York, and the plans for the plant at Ashland were prepared and work begun about December 1, but owing to the very severe winter it was somewhat delayed and was not ready for operation until about a month ago.

As the Ashland Iron & Mining Company has a large surplus of blast furnace gas which has been going to waste it was decided to utilize this gas under boilers and generate electric current for operating the mill. The boilers are installed at the furnace, and adjoining the furnace is a new engine and generator house, containing a Corliss engine built by the Atlas Engine Company, Indianapolis, Ind., and a generator furnished by the Stanley Electric Company, Pittsfield, Mass. The same company also supplied all of the motors.

In the operation of the cement plant the slag is drawn from the furnace and is run into a concrete pit large enough to granulate all the slag from the No. 2 furnace. It is taken from the pit by a Brown locomotive crane, which carries it to the cement plant, about 200 feet distant. The slag is deposited at the west end of the build-

ing three other tube mills and delivered from them as finished cement. It is then elevated and conveyed through a bridge to the stockhouse, shown in plan and sectional elevation in Fig. 3, which is placed 45 feet distant from the mill building. Each of the tube mills is direct driven by a 75 horse-power motor, these motors being located in a separate room from the mills. Two of the dryers are driven by a 15 horse-power motor and the other one by a 30 horse-power motor, which also operates elevators, conveyors and countershafting. There is one 15 horse-power and one 20 horse-power motor for driving other countershafts, elevators, &c., and the shaft running to the stockhouse.

Between the mill building and the stockhouse is a steel truss bridge, which carries a countershaft and a screw conveyor. The stockhouse is of an original design, being made entirely of concrete, except the roof, and is divided into four bins, each capable of holding 2500 barrels of cement. The cement from these bins is drawn off into a screw conveyor, delivered to an elevator and thence to a cross conveyor, from which it is bagged. The spouts from this conveyor each hold a trifle less than one bag of cement. The bag is set on a platform and raised by a foot lever so that the mouth surrounds the spout. A slide is then pulled and all the cement in the vertical spout is immediately delivered to the bag. The last 10

or 15 pounds is delivered by the conveyor at a speed easily controlled.

All the elevators have steel housing and there is no

The transmission machinery, elevators and conveyors were all furnished by the Webster Mfg. Company, Chicago, Ill. The buildings are made of concrete blocks, com-

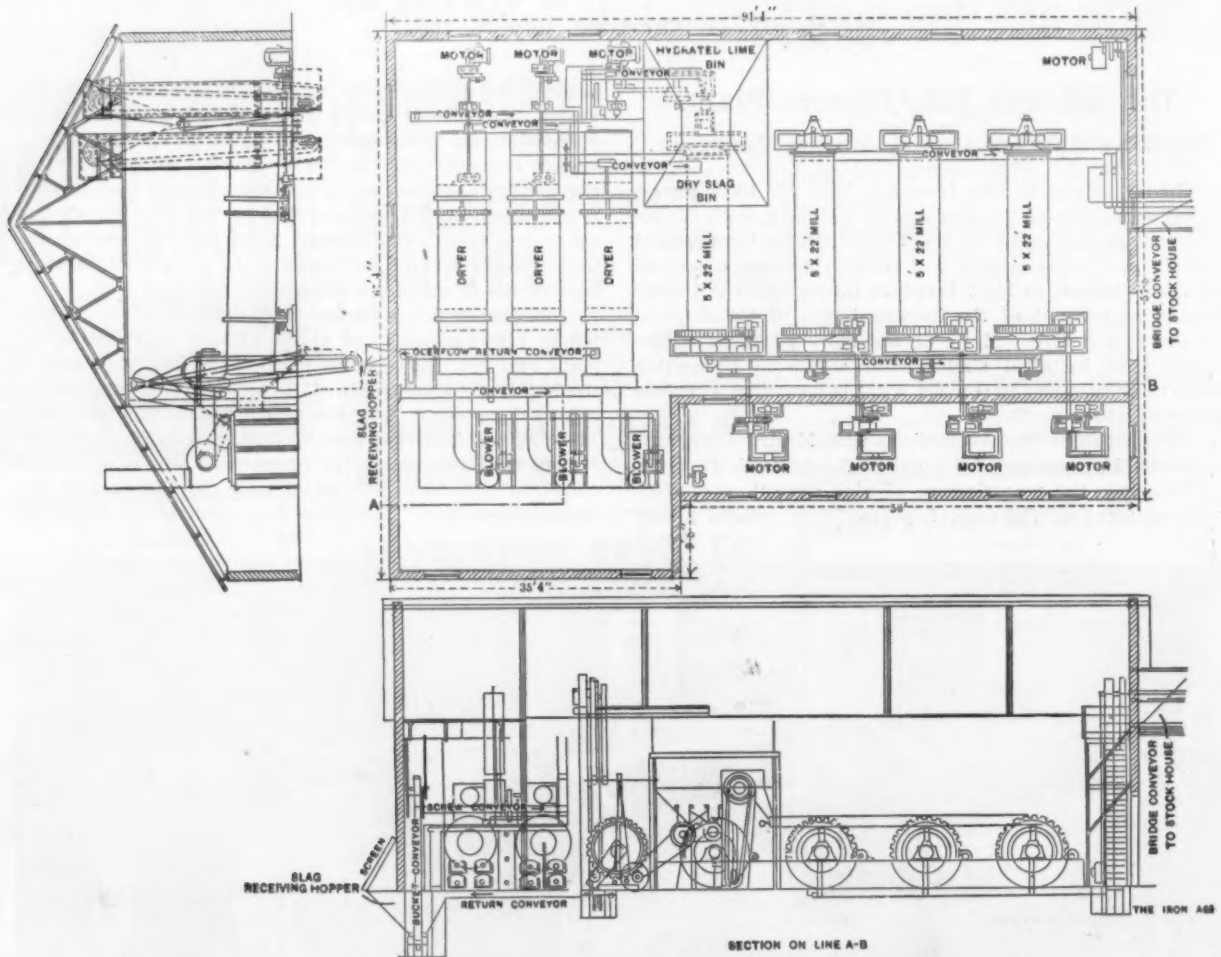


Fig. 2.—Plan and Elevations of the Cement Mill.

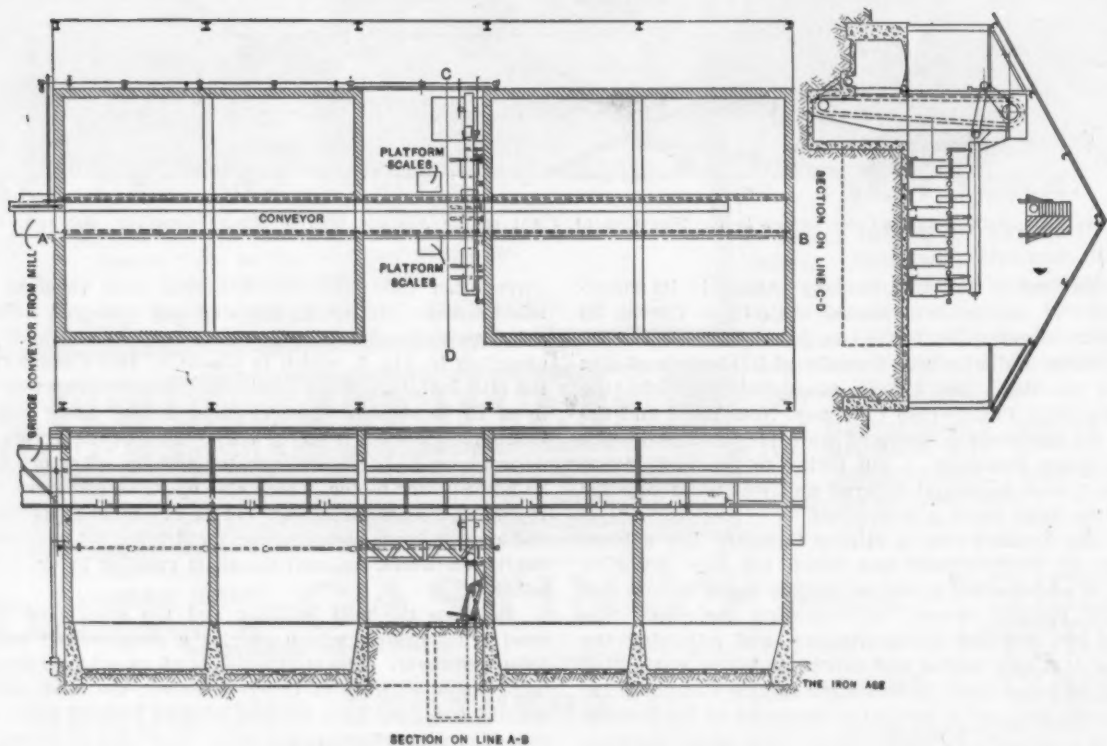


Fig. 3.—Plan and Elevations of the Stockhouse.

wood work in the entire mill building or stockhouse except window frames and sashes. The roofs are of steel truss construction, built by the Ritter-Conley Mfg. Company, Pittsburgh, Pa., on which is placed a slate roof.

posed of 1 part cement, 2 of sand and 5 of crushed slag, and were made with a Noyes F. Palmer block machine, making very handsome and substantial buildings. All the cement used in the construction of this mill was

slag cement made by the Stewart Iron Company, at Sharon, Pa.

The slag from the Ashland furnaces is of exceptionally good quality, carrying almost perfect proportions to make a high grade cement. The preliminary tests of this material have shown a cement which will test 500 pounds in 7 days and 600 pounds in 28 days, and the boiling tests

thence through the exhaust fan and a short stack to the air. The material is fed through the front head into the space between the outer shell and the inside flue and is raised and dropped by flights set at an angle with the shell, extending the full length of it, as shown in the cross section, Fig. 5. The material is continuously dropped on the outside of the inner flue and is held there

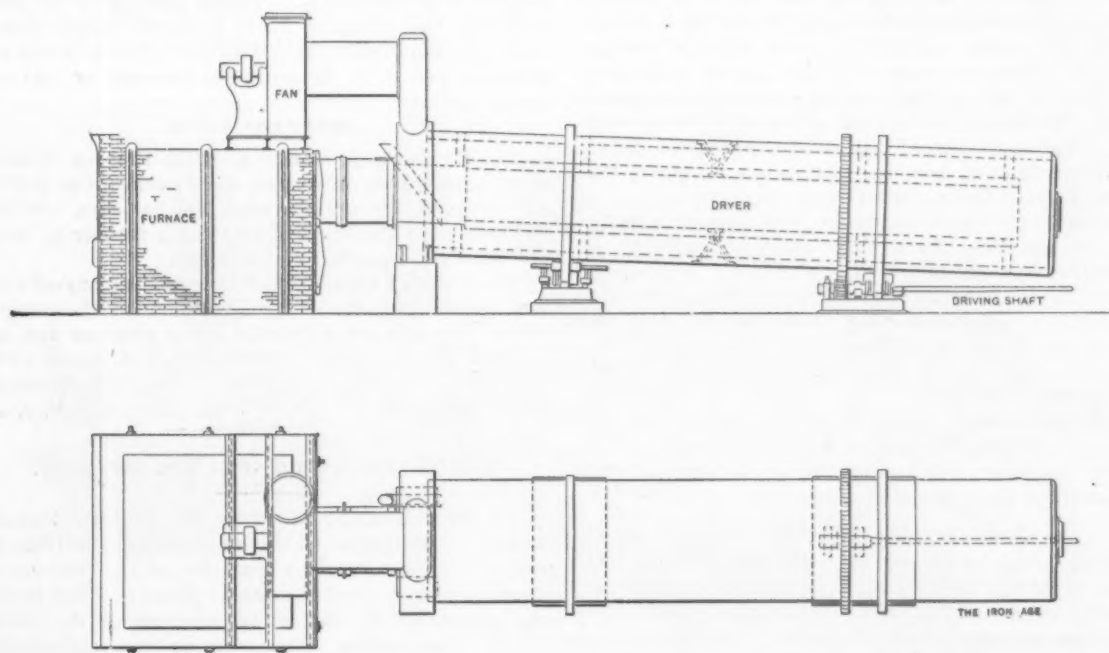


Fig. 4.—Plan and Side Elevation of One of the Ruggles-Coles Dryers, Showing Connection of Fan and Furnace.

show absolutely no free lime or expansives of any kind. As the power is supplied by waste gases from the furnace, and as the coal for the dryers comes from the Ashland Iron & Steel Mining Company's own mines, the cost of production of the cement will be very low.

Fig. 1 shows a view of the three Ruggles-Coles dryers and Fig. 4 a drawing showing the arrangement of one of

by flights extending the full length of it. As the machines continue to revolve the material is dropped to the bottom of the shell and by the inclination of the dryers is delivered out at the rear end. Around the outside of each shell are riveted two rolled steel tires, which rest on roller bearings, and the machine is driven by gear and pinion, the driving shafts being direct connected to alternating current motors.

The tube mills are of the well known continuous type, 60 inches diameter, 22 feet long and lined throughout with siliceous lining about 3 inches thick. Each mill contains about 10 tons of flint pebbles imported from Belgium. The material is fed automatically by a feeding device into the tube mills and is reduced by the grinding action of the falling pebbles as the machine revolves and is delivered out through the center bearing of the tube mill as finished cement.

The material is not handled from the time it is fed to the dryers and lime conveyor until it is put into bags at the stockhouse. The necessary labor is therefore very light and the plant is as nearly automatic as it is possible to make it.

The mill will be in charge of Simon Beard, who was formerly with the Stewart Iron Company, at Sharon, Pa. The construction work was under the supervision of D. J. McCarty of Newark, N. J.

Since the completing of this plant, C. J. Curtin, the engineer, and W. B. Ruggles, of the Ruggles Coles Engineering Company, have formed the Curtin-Ruggles Company, with headquarters at 39 Cortlandt street, New York city, to engage in the designing and constructing of slag cement plants.

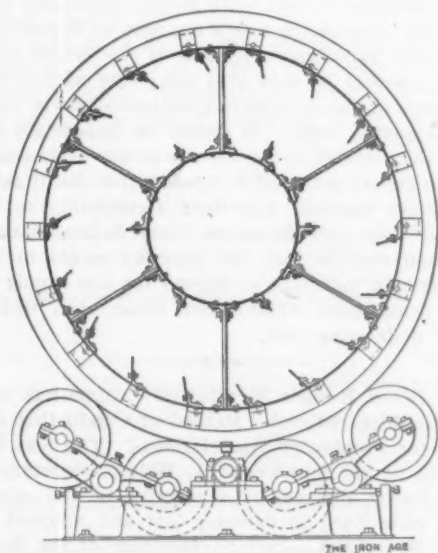


Fig. 4.—Cross Sectional Elevation of a Dryer, Showing the Drive and Interior Disposition of Flights.

them. Each dryer is built of $\frac{3}{8}$ -inch steel throughout, is 70 inches external diameter and 30 feet long, having an internal flue open at both ends, extending nearly the full length of the dryer. The hot gases from the furnace pass through a stationary neck lined with fire brick into the inside flue, running the full length of the dryer, and return back between the inside flue and outer shell,

The Crucible Steel Casting Company, Lansdowne, Pa., announces that it is now ready to manufacture crucible steel castings of every description. The plant is expected to supply a long felt want in the matter of small steel castings. The company is prepared to quote on special steel mixtures, such as nickel, chrome, tungsten, manganese, &c. The officers are: J. N. M. Shimer, president; C. R. H. Cunningham, vice-president and treasurer, and H. Bloodsworth, secretary.

Mexican Monetary and Tariff Changes.

A New Influx of Capital.

DURANGO, MEXICO, July 12, 1905.—The monetary system of Mexico has changed from a silver to a gold basis without the least disturbance of business interests; indeed, the beneficial effect of the new order is already visible in increased confidence among all who have investments in the country and also in a new influx of foreign capital—a movement which was temporarily suspended in the time of the low value of the peso in international markets. Exchange was normal and regular for several months prior to the actual placing of the Mexican dollar upon a fixed basis by law and this served to prepare the way and to make the transition easy.

The foreign railway companies, which benefit greatly by the change, have taken heart and are beginning to push their extensions, long held in abeyance. New smelters are being projected in which large amounts of United States capital will be invested. Durango has been selected as the site of one of these. Its establishment will be of great benefit to the mining interests of the State. While it cannot be said that any "boom" is visible in any particular quarter as a direct consequence of the fiscal change, it may be regarded as certain that none but favorable results can follow the Government's long deferred move in favor of sound money.

Some New Tariff Rates.

Further action of the Government in matters of importance to foreign exporters are the abolition of the free zone and a revision of the tariff, edicts covering both subjects having recently been promulgated. The free zone embraced a strip of territory south of the border into which merchandise was permitted to enter at a very low rate of duty as a sort of compensation and encouragement to the business interests of an at one time isolated district. The necessity for the maintenance of the conditions has disappeared with the building of railways.

Tariff rates have been changed upon the following classes of products in which readers of *The Iron Age* are interested:

Wire of copper, brass, bronze or white metal lined with any substance: 5 to 10 cents per gross kilo.

Naked wire of copper, brass, bronze or white metal, not exceeding 2 mm. in diameter: 8 to 10 cents per gross kilo.

Naked wire of copper, brass, bronze or white metal, exceeding 2 mm. in diameter: increased from 5 to 6 cents per gross kilo.

Steel in bars of various shapes: old rate, 5 cents per gross kilo; new rate, \$5.50 per 100 kilos gross.

Iron or steel wire, more than 1 mm. in diameter: old, 5 cents per gross kilo; new, \$5.50 per 100 kilos gross.

Iron or steel wire, 1 mm. or less in diameter: increased from 8 to 9 cents per gross kilo.

Iron wire for fences: increased from 2 cents per gross kilo to \$2.50 per 100 kilos gross.

Iron hoops and clamps for fastening packages: increased from 1 cent per gross kilo to \$2.50 per 100 kilos gross.

Plows and their loose parts or repair pieces, sickles, scythes and other implements for agriculture and clearings: increased from \$1.50 to \$1.65 per 100 kilos gross.

Iron or steel rails, when the weight of the linear meter exceeds 10 kg.: new rate, 2 cents per gross kilo.

Iron or steel rails when the weight of the linear meter does not exceed 10 kg., and switches, turtles, ties, frogs, spikes and fish plates for laying rails: new rate, 1 cent per gross kilo.

At present rails pay 1 cent per gross kilo when the linear meter weighs more than 12 kilos and are free when the linear meter does not weigh more than 12 kilos.

Iron or steel girders, not having perforations nor special cut: increased from 2 to 3 cents per gross kilo.

Girders and columns of iron or steel, when they have perforations or a special cut, brackets, bed plates for columns, fish plates, braces with or without bolts and other unspecified pieces of iron or steel for building purposes: increased from 3 to 4 cents per gross kilo.

Impure mineral oil: old rate, 3 cents per kilo net; new rate, \$3.30 per 100 kilos net.

Refined mineral oil, benzine, mineral wax and paraffin: increased from 8 to 9 cents per legal kilo.

Leather belts and cables for machinery: increased from 50 to 55 cents per gross kilo.

Belts of cow hair, felt for machinery: increased from 10 to 11 cents per gross kilo.

Railway Concessions and Construction.

The Mexican Central Railway Company has let the contract for the construction of the extension of the Collima branch to the port of Manzanillo, work upon

which was discontinued some two years ago. The same company is also actively pushing other construction work.

The Jalisco & Michoacan Railway Company, which owns a State and Federal concession to construct a railway, 300 km. in length, from the city of Guadalajara to Lake Patzcuaro, in Michoacan, increased its capital from \$1,500,000 to \$10,000,000 at a recent meeting of the stockholders. The company plans to begin construction at both ends simultaneously. William V. Bacus is the vice-president and J. N. Zermeno the manager of this company.

Industrial Notes.

The Kansas City, Mexico & Orient Railway Company recently placed an order with the American Car & Foundry Company for 400 box cars, 100 flat cars, 100 stock cars, two mail and baggage cars and a number of second and third class coaches and cabooses.

The Cananea Consolidated Copper Company of Cananea, Sonora, has obtained a concession for the construction of an extensive hydraulic power plant on the Aros River in the State named, the work to be begun within two years and completed within seven years of the date of the concession.

J. J. D.

British Report on Iron Ore Deposits.

The British Board of Trade has recently issued a volume of 300 pages which contains reports from the British consuls in various countries on the iron ore deposits in their respective consular districts. The inquiry was undertaken in 1903 at the instance of the British Iron Ore Association. The points on which information was asked are the following: The deposits in the consular district, nearest shipping port and how far away the deposits; cost of transport to port per ton; whether road, rail, or canal; character and cost of mining and loading, estimate of cost of mining (or quarrying) and loading in carts or trucks, per ton; any official analyses of ore; copies to be sent, or samples; proprietors rich or poor; will terms be reasonable or not; have deposits been worked; give quantities shipped for five years; any special obstacles to mining; any other special information respecting the ore supply or district.

In connection with their reports the consuls sent to London samples of ore, with maps, pamphlets and miscellaneous information which are now on deposit with the Commercial Intelligence Branch of the Board of Trade. It need scarcely be said that not being gathered by experts much of the information contained in the reports is of questionable value. It would be impossible to summarize the contents of the volume in any brief generalization, the report going with considerable detail into locations of ore deposits and their accessibility to English iron and steel manufacturers. One deduction might be made, and that is that the prospect seems to be that Great Britain will have to depend for her supply of iron ore on fields more distant than those upon which that country is drawing now.

The Labor Bureau Secretaries' League has issued a little pamphlet, entitled "Method of Conducting a Labor Bureau for Employers' Associations." The text is a report read by the late Frank A. Wilson, secretary of the Boston Labor Bureau, at a meeting of the secretaries held in New York in January last and adopted by the league. Herman S. Hastings, secretary of the Worcester Labor Bureau, Worcester, Mass., is secretary of the league.

The Hydro-Electric Power Commission is the name selected for the body appointed by the Ontario Government to inquire into the whole question of electrical production and development in the province. The commission is composed of Adam Beck, London, Ont., chairman; George Pattinson, Preston, Ont., and P. W. Ellis, Toronto, Ont. Cecil B. Smith has been appointed engineer to the commission. A secretary is yet to be appointed.

A Newton Special Duplex Milling Machine.

The Newton Machine Tool Works, Philadelphia, Pa., have recently designed and built for the Pittsburgh Reduction Company a special duplex milling machine, illustrated in Fig. 1. This machine is particularly intended for milling the surface of aluminum billets to remove the scale before the billet is rolled.

The cutter heads are 30 inches in diameter over the tools, and each head carries 24 special shaped tools of the

will be milled at the first setting and the billets will then be reversed to finish the other side.

This is believed to be the only machine adapted to this class of work and running at such a high cutting speed and feed.

Steam Turbine Tests.—The Westinghouse Machine Company, Pittsburgh, Pa., has recently made public a report on efficiency tests of a 400-kw. steam turbine built for Joseph Benn & Sons, Providence, R. I. These tests

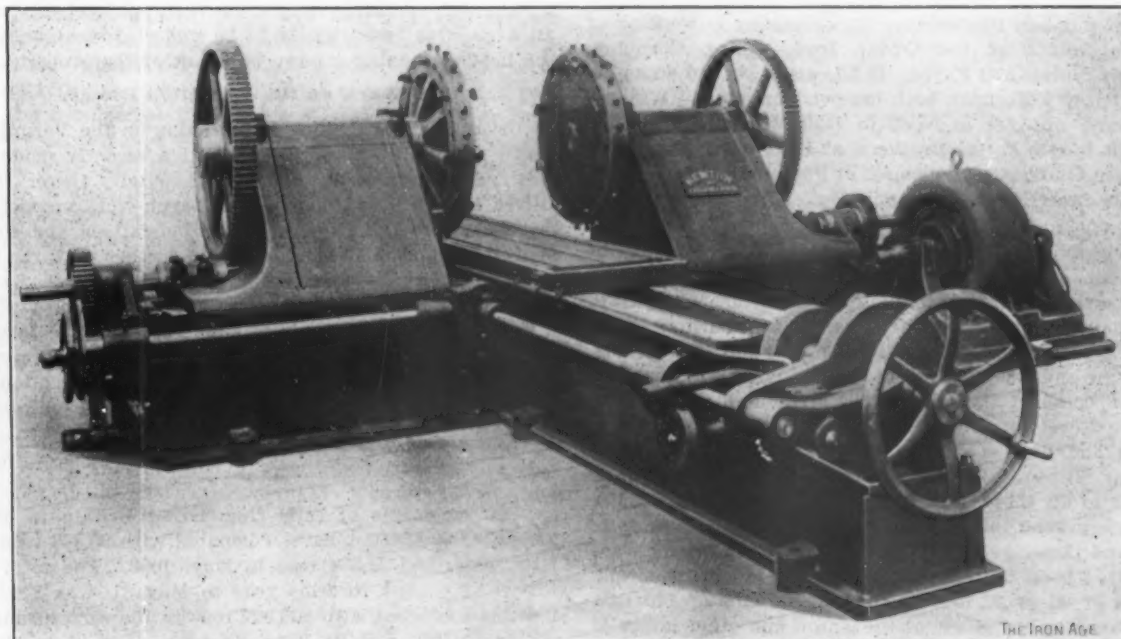


Fig. 1.—A Special Milling Machine, Built for the Pittsburgh Reduction Company by the Newton Machine Tool Works.

form indicated in Fig. 2. The spindles are 5 inches in diameter and are driven through spur gearing by a 25 horse-power Crocker-Wheeler motor. The gears are proportioned so as to give the tools a peripheral cutting speed of 500 feet a minute.

The carriage is 24 inches wide and 8 feet long over all and has an extreme movement of 7 feet. Through friction disks variable automatic feed from 6 inches to 36 inches per minute may be imparted to the carriage.

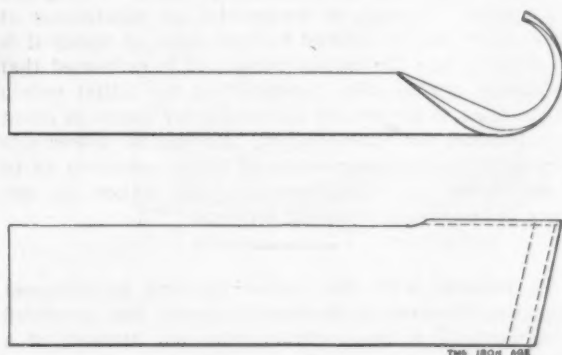


Fig. 2.—The Special Form of Tool Used in the Cutter Heads.

The carriage also has a power quick return and hand adjustment. The feed and quick return movements may be alternately engaged or thrown out of action by a clutch manipulated by the lever handle seen in the view. This lever is also controlled automatically by a rod carrying adjustable stops, making it possible to vary the length of the carriage travel.

It is the intention of the Pittsburgh Reduction Company to place a fixture in the center of the table extending its entire length. This fixture will be adapted to clamp two rows of billets, one on either side. One side of each row

were made by F. P. Sheldon & Co., Providence, R. I., to determine whether or not the guaranteed steam consumption at various loads was obtained. The equipment was a turbo-generator set consisting of a 600 nominal horse-power Westinghouse-Parsons steam turbine direct connected to a 400-kw. polyphase generator. With steam at 150 pounds pressure and 100 degrees F. superheat and a vacuum of 28 inches the steam consumption per brake horse-power at full load was 12.48 pounds, or nearly 11 per cent. better than the guarantee. With dry, saturated steam and the same conditions of pressure and vacuum the full load consumption was 13.89 pounds per brake horse-power, this being over 10 per cent. more than guaranteed. There was even better economy at one-quarter overload, 12.41 pounds being the consumption with superheated steam. The turbine showed a remarkable overload capacity and only a 6 per cent. decrease in economy at 108 per cent. overload.

The American Street Railway Manufacturers' Association, the organization formed at Saratoga in 1903 to take care of the exhibits at the conventions of the American Street Railway Association, announces its plans for the convention at Philadelphia, September 25-30. The south pavilion of the Philadelphia Museum and an adjoining building of larger area have been selected as exhibition halls. They are located on Thirty-fourth street, near South street, within 15 minutes' walk of the City Hall, and contain 75,000 square feet of floor space. Ample room is provided also for outdoor exhibits, and there are two railroad tracks, one 600 feet and the other 400 feet long. The membership fee of the American Street Railway Manufacturers' Association secures the privilege of reserving space. Daniel M. Brady, 95 Liberty street, New York, is chairman, and George Keegan, 13-21 Park Row, New York, secretary, of the executive committee which has the arrangements in charge.

Steam Shovels on the Mesaba.

DULUTH, MINN., July 17, 1905.—The number of steam shovels employed in stripping Mesaba range mines at the present time is the greatest in the history of the range. There are not less than 33 of them, nearly all of large size and great power. The average work of these shovels per 10 hours is 3000 tons each and they will employ not far from 75 men for every machine. Some of these shovels are worked day and night, so that the amount of earth being moved is something enormous. Among the contractors the Drake & Stratton Company has the largest number, 10 shovels. This company is working at several mines of the Oliver Iron Mining Company, notably Morris and Fayal. It has also Leonard stripping and that of Stevenson, both independent mines. Winston Brothers, who are at work in Mahoning pit, have four shovels busy. Porter Brothers, at Burt mine, have two; Wallace Contracting Company, at Forest mine, two; N. O. Werner, at Higgins, two, and Butler Brothers, at Leetonia, one, and at Larue mine, two. In addition to these the Biwabik Mining Company operates two shovels in stripping and the Oliver Iron Mining Company operates its own shovels in the Mountain Iron, Stephens and Hull, and has seven shovels busy there. In addition to all these, which are engaged in development operations alone, there are some 36 shovels occupied in mining at the open pit properties of the range. The great majority of these are at Stevenson, Burt, Mahoning, Mountain, Fayal, Biwabik and Stephens, with others at Leetonia, Leonard, Kinney, Hawkins, Larue, Higgins, Oliver and other mines. Added to all these are other shovels loading stock piles at underground mines of the range. There are some 12 to 15 of these, so that more than 80 steam shovels are employed upon the range. These vary in size from machines of 40 to 50 tons to those leviathans of 110 tons each, such as are in use at Stevenson and other mines of the district. Eighty shovels working busily all the time would make quite a hole in the Panama Canal cuttings.

A Successful Exploration.

E. J. Longyear, who is exploring the northwest quarter of the northwest quarter of section 27-58-20 for the Onondaga Iron Company, says that he is finding more good ore with the five or six drills he is working there than with all the other 40 or more that he has employed on Mesaba range explorations. The Onondaga is a local company, whose stockholders have been wonderfully successful in ore before and who secured the fee to this land some years ago. It is probable that 10,000,000 to 12,000,000 tons will be shown on this 40-acre tract. Not very much ore is showing up on this range just now and most of what is found is not of the best.

The Jones & Laughlin Operations.

The Jones & Laughlin Steel Company, which owns mines at Ishpeming and on the Mesaba range, is now using ore at the rate of about 2,000,000 tons a year. More of this amount is coming from its own mines than in any previous year, but it is still receiving ore on long time contracts from mines both on the Mesaba and old ranges. Of its own mines it has been expected that Leetonia would supply a larger tonnage this year than any other property, 400,000 tons, and that Lincoln will make an output of nearly 300,000. This mine is a large one, contains excellent ore and could be mined much more heavily, but it is not desired to push it. Lake Angeline, at Ishpeming, is not to mine quite 100,000 tons, as its supplies are to be conserved. For some years practically the whole product of the Oliver Iron Mining Company's Duluth mine, Mesaba range, has gone to this company, adding 150,000 tons to its supplies. Next year its own Grant will be a large producer of excellent non-Bessemer ore and probably at low cost. At 400,000 tons a year Leetonia is good for at least 25 years, while complete exploration of the ore body may show a much longer life. Lincoln at the present rate is good for a still more extensive future and Grant has ore enough to warrant a very large annual shipment for 30 to 40 years. Lake Angeline is about done.

The company has a large tonnage of new ore in the Cascade district especially adapted for mixing with its

Mesaba tonnages. The company has been exploring in the Negaunee district for two years past with commendable persistence, but without very large results, so far as report goes. Just now drills are starting for this company in the Swanzy district, near Marquette, where work by the Cleveland Cliffs and others during the past year and longer has probably shown results. The location of this new work is near Princeton and Austin mines, and there will be many holes drilled if the first work proves encouraging. At Hennepin mine, Gogebic range, the company is now exploring, having unwatered and cleaned out the property. N. B. Roscorla, a well-known mining man of the old ranges, has been put in charge, and an aggressive campaign is to be undertaken at once in the hope of making a large mine out of the property.

New Work on the Vermillion Range.

Some diamond drilling is beginning on the Vermillion range in fulfillment of the prediction recently made in this correspondence as to increased activity there. The Oliver Iron Mining Company has begun work on section 5-62-14, where there are excellent indications and some ore. At Robinson Lake, a township further east, the old Bisbee property is under exploration. Still further east the White Iron Lake Iron Company has resumed after a long cessation. Work is to start soon on Pine Island, north of the Soudan mines, and there are deals in progress for other drill work along the range. The resumption of work in such a costly region is a pretty good indication of the strength of the present inquiry for iron.

D. E. W.

The shipments of rails from Great Britain in May amounted to 48,601 tons, as compared with 65,578 tons in May, 1904, and 71,584 tons in May, 1903. The total of export shipments for this year to May 31 was 219,377 tons, as compared with 206,902 tons in the corresponding period of 1904 and 281,252 tons up to May 31 in 1903. The principal item in this year's exports is 87,256 tons to British India. Exports to British South Africa have fallen off very considerably, having been 6664 tons for the first five months this year and 28,319 tons and 62,560 tons in the corresponding period of 1904 and 1903 respectively. To Canada the rail exports for the first five months of 1905 were 6025 tons. In the corresponding period of 1904 and 1903 they were 12,875 and 24,702 tons respectively.

The first commercially operated single phase railway is in the Tyrol, near Innsbruck. Each motor car has four 40 horse-power motors connected in two groups in parallel and operated at a frequency of 42 cycles per second. The line is 12 miles long, and contains a number of long and stiff grades. Current is transmitted to substations at 10,000 volts, and is reduced to 2500 volts, at which it is fed directly into the trolley wires. It is estimated that the energy consumption, measured at the initial switch boards so as to include all line and other losses, is about 70 watt-hours per ton-kilometer. Mechanical power was calculated from measurements of train resistance to be 48 watt-hours per ton-kilometer. This makes the efficiency of the system about 68 per cent.

To compete with the carbon filament incandescent lamp the Siemens & Halske Company has produced experimentally a lamp with a tantalum filament of a metal tougher and harder than steel. A commercial form of the lamp proves to require only 1.7 watts per candle-power, as compared with about double that amount in the regular type. To get a sufficient resistance for 110 volts it is necessary to make use of a filament about 30 inches in length. This is wound back and forth over supports, so that the size of the bulb is only slightly larger than with the carbon form. The life of the lamp appears to vary between 400 and 600 hours, as compared with 1000 hours, the average life of the present lamp. The light is very white. The high economy of the new lamp makes it apparent that nothing but first cost impedes its large commercial usefulness.

The Wellman-Seaver-Morgan Air Compressor.

The cylinder and valve arrangement adopted by the Wellman-Seaver-Morgan Company, Cleveland, Ohio, for high speed air compressors is shown in Fig. 1. These drawings show one cylinder of a compressor having a capacity of 4000 cubic feet of free air per minute compressed to 75 pounds gauge pressure. There are two air cylinders, the intake cylinder being 40 x 60 inches and the high pressure cylinder 25½ x 60 inches. Both are water jacketed.

It was the aim in this design to completely separate the positive closing of the discharge from its automatic opening. This is accomplished by dividing the discharge valve into two parts, one of which is positive and a part of the mechanical inlet valve S, which is driven by a heavy eccentric. The discharge valve D is automatic, being controlled by a differential piston, P, operated by air pressure. The inlet valve S also positively controls the opening to the discharge valve D, the opening being timed to take place near the beginning of the compression stroke.

The events of the stroke are shown on the theoretical indicator card, Fig. 2. At *a* the valve S begins to open the inlet passage to the cylinder, air being drawn into the cylinder up to the end of the stroke at *b*, when the inlet is closed by the return of the valve. As the piston moves toward the right the valve S continues to rotate toward the left. At the point marked *c* on the diagram the cylinder is brought in connection with the passage leading to the discharge valve D. The discharge valve

speed. There are no springs, hooks or complicated devices, and all parts, with the exception of the valves, are outside the cylinder. If water accumulates in the cylinders or operating pot the valve D lifts from its seat to relieve the excessive pressure.

The inlet area of the compressor is proportioned so that the loss of pressure in the cylinder at the end of the inlet stroke is less than 2 ounces per square inch. This design also reduces the clearance to less than 1 per cent.,



Fig. 2.—A Theoretical Card Showing the Events in the Air Cylinder.

and the weight of air discharged per stroke is over 92 per cent. of the weight corresponding to the piston displacement.

The assessed valuation of mines of Ishpeming, Mich., has been fixed for the year as follows: Oliver Iron Mining Company, this including the Lake Superior and Hartford, \$1,709,000; Cleveland Cliffs Iron Company group at Ishpeming, \$2,212,200; Lake Angeline, \$845,000; East New York, \$30,500; total, \$4,796,700. Negaunee valuations are a total of \$3,000,000, of which Negaunee of

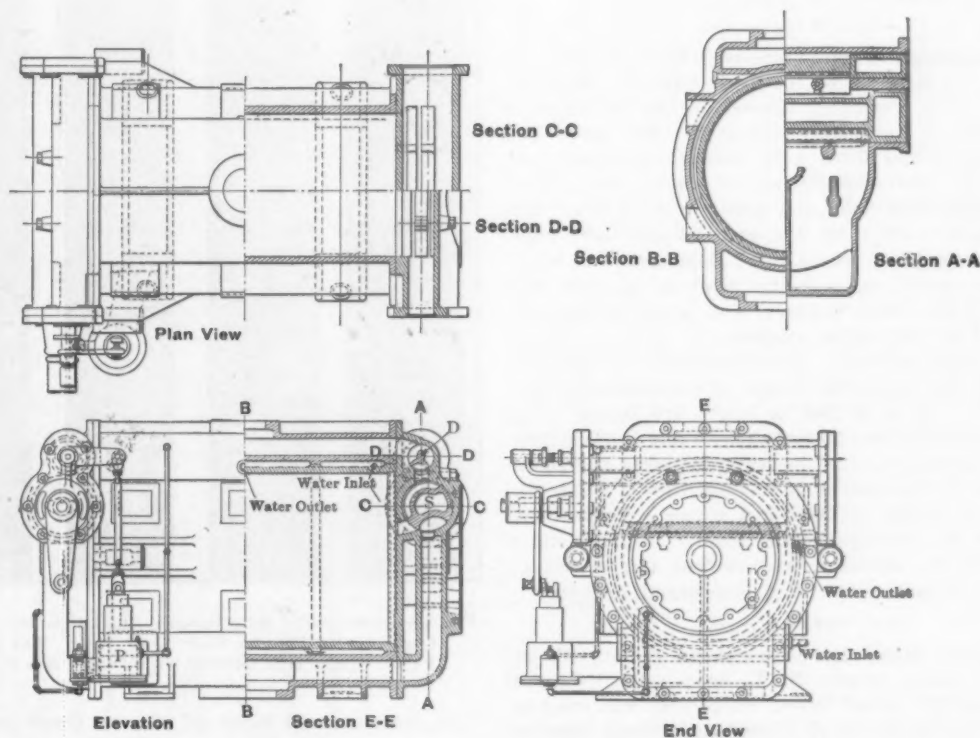


Fig. 1.—Details and Sections of the Air Cylinder of the Wellman-Seaver-Morgan Compressor.

does not open until a point, *d*, is reached, the opening pressure being made a little less than the discharge pressure by the proportions of the differential piston P, which controls valve D. This arrangement overcomes any tendency of the air pressure in the cylinder to exceed the discharge pressure. The outlet valve D remains open during the entire discharge period and only commences to close on the return stroke of the main piston. In other words, the valve D closes during the period represented by the line *e a b* on the diagram. The time required for the opening and closing of the discharge valve is thus extended from about one-quarter of the stroke, with the usual poppet valve, to about one and one-quarter strokes with the improved valve. This feature permits high

Cleveland Cliffs Company leads with \$1,025,000; Regent group of the Oliver Iron Mining Company, \$800,000; Cambria and Mary Charlotte, \$285,000 each.

In a great irrigation project involving an ultimate expenditure of some \$25,000,000, recently authorized by the Secretary of State for India, an area of about 6250 square miles is to be served, though but a fraction of this area is to be reached for the present. In the total area served it is estimated that about 3000 square miles will be actually under irrigation. The water will be taken from the Jhelum River, which furnishes at the head works proposed an unappropriated volume of 6000 to 7000 cubic feet per second.

Economies of Mechanical Draft.

Concerning mechanical draft the following statements are made in "Chemical Technology" by Mills and Rowan:

"The principles of what is now becoming well known under the name of 'forced combustion' have been repeatedly advocated during past years by those who have devoted thought and study to the subject. The position assumed by them—which is now finding favor among engineers—has been, in brief, that the air supply required for combustion in furnaces can be more economically furnished by mechanical power than by the action of chimneys and that the mechanical method has other advantages which enable it to be preferred to the one which is older, but more imperfect. One of these advantages is the higher temperature of combustion, which is equivalent, with a boiler of good design, to an increased evaporative power of the boiler or to increased evaporative effect for the fuel. Another advantage, which has not been fully realized in any plan as yet introduced in practical work, is that the rate of travel and escape of flame and hot products of combustion is under control. It is thus possible to cool them more completely than can be done when chimney draft is used, and this means a saving of heat which would otherwise be uselessly dissipated. Mechanical or artificial draft thus presents to us a method of economically furnishing the air supply to furnaces and producing a more efficient combustion temperature, while it also renders possible further economies due to retarding the movement and escape of hot gases and to preliminary heating of the air supply by waste heat or otherwise."

The Pittsburgh Rivet Company.—This company has purchased and is operating the plant formerly owned by the Eclipse Mfg. Company, located on the Baltimore & Ohio's Junction Railroad, Pittsburgh. The plant has been remodeled and fitted with modern machinery and equipment for the manufacture of rivets, bolts, upset rods, forgings, drift bolts and mine car hitchings. The main building is 100 x 200 feet and contains three automatic rivet machines, three hand feed rivet machines, two forging machines, a heavy pointing machine, one Bradley and one chain hammer; also screw cutting machines, drill presses, lathes, shapers and other machinery used in this line of work. Each automatic riveting machine is fed from a 32-foot improved continuous furnace in which rods up to 30 feet in length are heated. The output of rivets is from 20 to 50 tons a day in sizes from $\frac{1}{2}$ inch by $\frac{3}{4}$ inch up to $3\frac{1}{2}$ inches in diameter and cut to any length. Motive power is furnished by a 150 horsepower Miller double cylinder gas engine. Natural gas is used for fuel throughout the plant. W. C. Reitz is president; F. W. McLean, vice-president and secretary; J. H. Reitz, treasurer, and W. F. Dowerman, manager.

A Thurston Memorial.—Students of Sibley College, Cornell University, Ithaca, N. Y., have ordered designs made for a \$1500 bronze tablet which they will erect in memory of the late Dr. R. H. Thurston, formerly Director of Sibley. The tablet is being designed by Prof. H. S. Gutsall of the College of Architecture and will be erected in a stone niche of the new Thurston Hall of Engineering, now in process of construction.

A second steamship is about to be placed upon Lake Titicaca, in Peru, the highest navigated water on the globe, being 13,000 feet above sea level. The new vessel has a length of 220 feet, a beam of 30 feet and a depth of 14 feet, and is designed to carry about 550 tons dead weight, with accommodations for 24 passengers. She will be propelled by twin screw engines, developing an aggregate of 1000 horse-power and giving her a speed of 12 knots. The ship, built by the Earle Shipbuilding Company, Hull, England, was taken down and shipped to its destination in small parts, each carefully numbered, and is being re-erected on the shores of the lake, into which it will be launched.

Paper as Protection for Iron and Steel.*

BY LOUIS H. BARKER.

About 11 years ago experimental investigation was begun with numerous well-known and established iron paint preservatives in order to ascertain by actual exposure tests the best one to resist the destructive action on steel structures of sulphurous gases in the form of smoke combined with the moisture of steam, and since that time 50 or more paints and combinations have been tried. As will be seen by the list herewith among them were many kinds of asphaltum, rubber, graphite, carbon, lead and iron paints, and though the results showed varying degrees of resistance, it is remarkable that even

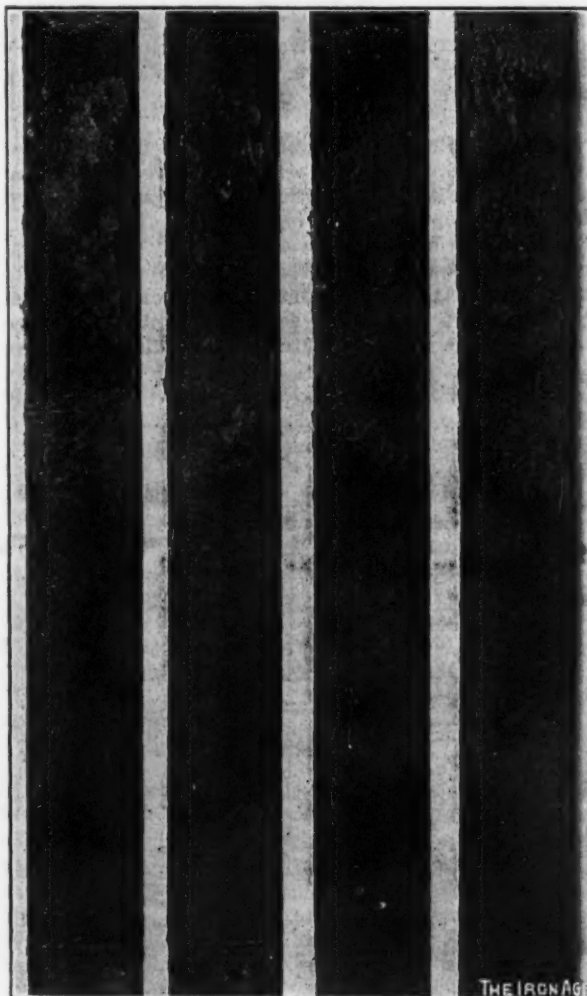


Fig. 1.—Experimental Bars Exposed Eight Months.—Lower Half Covered with Paraffin Paper Over Which Was One Coat of Paint. Upper Half Covered with Three Coats of Paint.

with three coats of paint not one was found that did not show rust in less than a year. Of course it is to be understood that the exposures were made so as to subject the test bars to the severest action possible in order to obtain the quickest results.

In making the first series of tests new steel plates 10 inches square were used. As, however, the adverse conditions we were trying to overcome related to rusty steel, which is more difficult to preserve than new steel, rusty plates were substituted in all tests thereafter. And still further to endeavor to meet the existing conditions new plates were hung up and exposed to the smoke fumes until they became covered with sulphur scale. The thought was that an oxide scale due to atmospheric exposure might give different results. This scale or rust formation on these new plates apparently varied not only in amount but also in the time of its formation, supposedly due to different chemical composition. As

* A paper read at the Atlantic City meeting of the American Society for Testing Materials, June, 1905.

PROTECTION OF IRON AND STEEL STRUCTURES BY MEANS OF PAPER AND PAINT.

Test No.	a No. 1. December, 1893.	a No. 2. February, 1895.	a No. 3. May, 1895.	b No. 4. January, 1896.	c No. 5. July, 1896.	c No. 6. July, 1897.	c No. 7. October, 1897.	c No. 8. March, 1899.	c No. 9. December 1900.	d No. 10. June, 1902.	e No. 11. March, 1904.	f No. 12. November, 1904.
Plate No. 1.	Red Lead.	Bessemer.	Ochre.	Red Oxide.	Red Lead.	P. & B. Universal.	Cerion.	Anti-Rust No. 1.	Red Oxide.	Black Cerion.	Paper.	Paper.
" 2.	Red Lead.	Bessemer.	Ochre.	Red Lead.	Indurine.	P. & B. Ruberine.	Durable Metal Coating.	Anti-Rust No. 2.	Red Oxide.	Rubber.	Paper.	Paper.
" 3.	Graphite.	Rubberine.	Freight Car Brown.	Litho Carbon.	Dudley's Olive.	Lawrence Permanent.	Graphite.	Anti-Rust No. 3.	Red Oxide.	Toltz Asphalt.	Paper.	Paper.
" 4.	Graphite.	Rubberine.	Freight Car Brown.	Dudley's Olive.	Cerion.	Carbonizing Coating.	Sulphur and Asphalt.	Red Lead.	Cerion.	Pikrite.	Paper.	Paper.
" 5.	Eureka.	Black Anti-Rust.	Graphite.	Dudley's Freight Car.	Graphite.	Black Bridge.	English Red Oxide.	Baltimore Varnish.	Cerion.	Asphalt.	Paper.	Paper.
" 6.	Eureka.	Red Anti-Rust.	Red Lead.	Manganese.	Bessemer.	Mamolith.	Dudley's Asphaltum.	Graphite.	Cerion.	Valentine's Water Proof.	Paper.	Paper.
" 7.	English Red Oxide.	Santarut.	Black Bridge.	American Iron & Steel Primer.	J. R. Smith.	Cerion.	National Red Lead and Red Oxide.	Toltz Asphalt.	Anti-Rust No. 1.	American Acid Proofing.	Paper.	Paper.
" 8.	English Red Oxide.	Santarut.	Black Bridge.	Graphite.	Black Bridge.	Graphite.	Carbonizing Coating.	Galley.	Anti-Rust No. 1.	Protectus Gray.	Paper.	Paper.
" 9.	English Red Oxide.	Black Bridge.	Red Oxide.	Townsend's Metallic Asphalt.	Mamolith Brown.	B. P. S. Nobrac.	Carbonizing Coating.	Non Corrosive Gray.	Anti-Rust No. 1.	Seaboard Carbolin.	Paper.	Paper.
" 10.	Black Bridge.	Black Bridge.	Red Oxide.	Black Asphalt.	Dudley's Freight Car.	Pure Rubber.	Carbonizing Coating.	Carbonizing Coating.	Carbonizing Coating.	Standard Black Bridge.	Paper.	Paper.
" 11.	Graphite.	Graphite.	Red Oxide.	Brown Asphalt.	Red Oxide.	Graphite.	Durable Metal Coating.	Durable Metal Coating.	Carbonizing Coating.	Paper.	Paper.	Paper.
" 12.	Graphite.	Graphite.	Red Oxide.	Metal.	Graphite.	Graphite.	Cerion.	Cerion.	Rubber.	Protectus.	Paper.	Paper.
" 13.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Red Oxide.	Red Oxide.	Rubber.	Protectus.	Paper.	Paper.
" 14.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Fireproof.	Fireproof.	Rubber.	Protectus.	Paper.	Paper.
" 15.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Non-Corrosive.	Non-Corrosive.	Rubber.	Protectus.	Paper.	Paper.
" 16.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Protectus.	Paper.	Paper.
" 17.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 18.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 19.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 20.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 21.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 22.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 23.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 24.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 25.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 26.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.
" 27.	Red Oxide.	Red Oxide.	Red Oxide.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Graphite.	Toltz Asphalt.	Paper.	Paper.

a These tests were made on new plates, 10 inches square, painted three coats, one week between coats, and exposed when dry.

b This test was made on new plates, 10 inches square, painted two coats, one week between coats, and exposed when dry.

c These tests were made on old plates, 10 inches square, that had first been rusted by exposure to smoke, then removed, cleaned with wire brushes and painted with two coats of the different paints, one week between coats, and exposed when dry.

d This test was made on angle bars, 11 feet long, that had first been rusted by exposure to smoke, then removed, cleaned with wire brushes and painted with two coats of the different paints, one week between coats, and exposed when dry.

e This test was made on bars 2 feet long, some of which were new, the remainder old as indicated, New, Old, Old bars had first been rusted by exposure to smoke, then removed and cleaned with wire brushes. Half of each bar covered with paper, the remaining half painted three coats, as above, one week between coats, and exposed when dry.

f This test is now in progress, all bars but two being covered with paper. Only the outside coat of paint is given.

Table I.—List of Paints Tested from 1893 to 1904.

NOTE.—The order in which the different paints appear does not indicate their relative standing in any of the tests.

this might again give some variations in the experimental results, in order that all paints should be on as like footing as possible angle bars 11 feet long were made use of and as before hung in the smoke until rusted, then cleaned with wire brushes, each foot of the bar painted with a different paint and again hung up. The results, however, continued to be unsatisfactory.

Rust Action Underneath the Paint.

In examinations of the test bars from time to time it was seen that upon many of them the paint was intact, but with protruding points, which upon being pricked were found to be small rust formations pushing up the paint from behind, clearly indicating that it was not the failure of the paints, but the rust action on the inner surface that caused the damage. As no rust can form without the presence of moisture, and as all paints are pervious to moisture (as Dr. Chas. B. Dudley's careful investigations at Altoona, Pa., for the Pennsylvania Railroad have proved), this led to the conclusion that it would be necessary in some way to tightly seal the surface. Many kinds of materials for doing this were tried, with as many different results, until three years ago it was decided that a cheap paraffin paper answered the purpose best of all, and since that time all experimentation has been along that line. Besides its application on experimental bars the paper covering has been tried in a small practical way against smoke action, and after two years and three months' exposure an examination of very recent date shows the outer paint, the paper and the first or adhesive coat all intact and in many places where paper was removed for examination the adhesive coat not yet dry and the surface of the steel the same as when painted.

With such satisfactory results from this paper process in the smoke tests it was concluded to make a large scale application and severe test on a large number of I-beams supporting a floor over and within a few feet of salt water and upon which the rust was due not to smoke but to the almost continuous dampness and presence of sewer gases. This was done over a year ago, and up to this time indication of damage of no kind is apparent.

The mode of application of the paper is as follows: After the rust is carefully cleaned off by means of stiff wire brushes a certain kind of tacky paint is applied, the paper then covered over and tightly pressed upon the painted surface, the joints of the paper slightly lapping. As soon as the paper is in place it is ready for the outside coat of paint. It will be observed that by this process the first coat of paint, the paper and the coat of paint over the paper can be applied with one scaffolding, thereby greatly reducing the cost, especially in high and dangerous places.

These experiments, extending over only three years, are of too short a duration to determine the value of paper as a protection for iron and steel, but they certainly bring out the fact, at least in the case of smoke and gases, that the action begins from behind the paint and not from in front by the disintegration of the paint.

J. M. Gledhill of the Armstrong-Whitworth Company, Manchester, England, is authority for the statement that ordinary crucible steel containing 1.3 per cent. carbon is suitable for the smallest turning and planing tools, drills and cutters, razors and surgical instruments; 1.15 per cent. carbon for heavier tools and drills and engraving tools; 0.9 per cent. for taps, dies, large reamers and circular cutters, the heaviest turning tools and drills; 0.8 per cent. for cold chisels, hot sets, small shear blades and large taps; 0.75 per cent. for dies, cold sets, hammers, punches and blacksmiths' tools, and 0.65 per cent. for snaps, dies, drifts, hammers and stamping dies. Many shop troubles are occasioned by failure to make any record of the carbon properties of the various steels kept in the tool room, this resulting in the frequent use of steels for purposes for which they are totally unsuited. Where some system is adopted to prevent this sort of difficulty it is found that a large part of the trouble disappears.

Electric Power from Blast Furnaces.

BY P. EYERMANN.

Advantages of Engines Driven by Blast Furnace Gas.

Gas engines driven by blast furnace gas have now been in successful operation in Germany more than ten years. In the very first stages of this development many prominent engineers reached the opinion that ultimately this use of the blast furnace gas would result in the erection of auxiliary plants to take advantage of the power thus cheaply generated. There is no doubt that large cities such as New York, with the enormous amount of electric power they require, would offer opportunities for profit from the erection of such works. The writer has made a calculation for the purpose of demonstrating in detail why such a proposition has a good basis. Objections may of course be raised on the basis of experience obtained with existing furnaces of the old fashioned type. The smoke from coal fires in operating boilers and the enormous quantities of dust escaping from blast furnace stacks, stoves and chimneys may afford ground for serious objections. But these troubles are overcome with gas engines, and a modern blast furnace plant can be made to keep its surroundings thoroughly clean. Even if coal is supplied directly to a plant and not coke, there is no dangerous smoke or gas escaping from up to date coke ovens.

In cities with convenient harbor equipments like New York or Philadelphia a big coke oven plant, blast furnaces or a steel plant may become a desirable industry in the future, since it would be coupled with less dust and smoke troubles than any large city power and light plant, skyscraper building or illuminating gas works.

The following improvements made in the last ten years constitute the most important reasons for a change in the iron industrial situation: No waste in coal, no waste in coke, no waste in water, no dust nuisance from iron ores, no nuisance from smoke, no escaping steam, no steam engine, no smokestack at all, no boiler explosion danger, no boilers.

A Furnace Plant Considered as a Gas Producer.

The main point in regard to the construction as well as concerning the management of such a big gas producer as a blast furnace plant may be considered as follows: The complete plant may be based to-day on selling electricity and obtaining as main by-products coke (with its auxiliary by-products, sulphate of ammonia, benzol, sal-ammoniac, tar and naphtha), pig iron (with its auxiliary by-products, slag cement, bricks and heating gas) and steel, if desired. As the installation of gas engines instead of steam motors is the most important matter, therefore the apparatus for gas manufacturing, such as the coke ovens and blast furnaces, must be constructed with reference to the most favorable conditions for the operation of the gas engines. The coke ovens as well as the blast furnaces should be provided with a charging mechanism, which works as continuously as possible, because the thermal efficiency of the gas engine depends upon the regular and continuously uniform quality of the gas. The financial efficiency of the plant depends also upon the gas engine, as the latter produces the main product—namely, electricity.

There is also no doubt that a continuous charging of the blast furnace assures a better run and a better gas. Thus the main product is also obtained very regularly and the by-products can be drawn continuously in lieu of intermittently, as now. The pigs may be made by continuous casting on an improved pig iron casting machine, and the same can be said for the slag. If pigs of only 40 pounds each are cast (and this is convenient for cupolas) and the blast furnace should be of 576 tons daily capacity, then 20 such pigs are cast per minute, or one for each three seconds of casting time, which is just right for the machine.

New York as a Furnace Location.

A blast furnace plant in New York would be based on a supply of iron ores shipped from the lake harbors to

the plant by water from Buffalo. Other sources would be Canada, Spain, &c., by the Atlantic Ocean. The fuel supply may be based on direct coke contracts or on shipments of coal from Pennsylvania, Virginia, &c. The latter method may be preferred, as the power from the coke oven gas is secured and the other by-products are made right in the market. Thus, starting with the coke ovens, an approximate calculation is as follows:

Of coal, 11,000 tons yield 10,000 tons of dry coal or are converted into 7850 tons of coke; the balance on an average consists of 120 tons of ash, 110 tons of sulphate of ammonia, 100 tons of tar, 30 tons of pitch, 60 tons of benzol, 5 tons of naphtha and 2 tons of sal-ammoniac, or about 8250 tons of products out of 10,000 tons of dry coal. There is also produced 1600 tons of coke oven gas from which it is desirable to earn profits. If such a complete plant belonged to the municipality the city would have its own required electricity free of cost.

Practice has proved that 1 ton of coal is equivalent to 10,000 cubic feet of such gas, or even more. The heating value is nearly the same as that of city gas, averaging, say, 600 British thermal units per cubic foot. Many gas engines will yield 1 horse-power for 10,000 British thermal units, but, conservatively, 12,000 British thermal units may be taken in this calculation, making each horse-power require only 20 cubic feet of coke oven gas per horse-power per hour. Of the gas made 50 per cent. is used for heating the ovens, and if a further loss is allowed of 10 per cent. of the gas for uncontrollable leakage, or for engines running under less favorable conditions, then 4000 cubic feet of gas is available for power, or 200 horse-power for each ton of coal.

The same result may be checked in the following way: 1600 tons of coke oven gas will yield approximately 112,000,000 cubic feet, as 1 ton of gas is equivalent to 70,000 cubic feet at normal temperature. Deducting 10 per cent. for loss and 50 per cent. for heating purposes leaves 44,800,000 cubic feet, or 2,240,000 horse-power. Dividing this by 11,000 tons, the quantity of coal, we reach an equivalent of 230 horse-power per ton of coal, or, referred to the coke, approximately, taking 216 horse-power as an average of the above two results per ton of coke, 200 horse-power, which is usually lost today.

Details of Operating Such a Plant.

One ton of pig iron requires an average of 1 ton of coke and 2 tons of iron ore. With one furnace of 576 tons daily output especially designed as a gas producer for the subsequent generation of electricity through gas engines, the calculation works out as follows:

With the object of obtaining somewhat richer blast furnace gas than may be obtained by using coke alone some coal may be charged into the furnace with the coke. It may be preferable also under certain conditions to mix the furnace gas with the gas from the coke ovens in order to secure a more uniform gas. For each ton of pig iron there would be obtained an average of 150,000 cubic feet of gas having a heating value of at least 100 British thermal units per cubic foot. As it may be also possible in the future to heat the required blast with the waste heat of the liquid cinder, thus doing away with the stoves, it is even conceivable to figure that for each ton of pig iron may be produced the following power: The gas has $150,000 \times 100 = 15,000,000$ British thermal units, and the gas engine requires 12,000 British thermal units per horse-power, thus making 1 ton of iron equivalent to 1250 horse-power in a 576-ton plant, or 30,000 horse-power per hour.

At present, however, we must consider the following: From this, $150,000 \times 24 = 3,600,000$ cubic feet of blast furnace gas 25 per cent. is to be deducted for heating the stoves. In earlier days the amount was higher, but in a modern plant, equipped with improved cleaning apparatus, not more will be required. Therefore 900,000 cubic feet are set aside for heating gas for the blast.

For supplying air to the coke in the blast furnace by means of the blowing engines the latter are built on an average for, say, 80 to 100 cubic feet of air per pound of coke charged. For 24 tons of coke required per hour under these conditions $2000 \times 24 \times 100 = 4,800,000$ cubic

feet of air are required per hour. With a pressure of 20 to 25 pounds on an average, each 100 cubic feet per minute may require horse-power up to 5 per hour, or $4,800,000 \div 60 = 80,000$ cubic feet per minute, requiring an engine of 3200 to 4000 horse-power. Each horse-power of that engine would require 12,000 British thermal units, or 100 cubic feet, of blast furnace gas, which would result in a further deduction of 400,000 cubic feet of gas for the blowing engines.

The uncontrollable leakages and losses in an up to date plant should not be more than 5 per cent., or 180,000 cubic feet.

Mechanically operated cleaning plants have given the best results and are using from 0.4 to 0.7 horse-power for 1000 cubic feet. If all the gas is cleaned this would take $3600 \times 0.7 = 2520$ horse-power, or another loss of 252,000 cubic feet, of gas per hour, for cleaning purposes.

For auxiliary machinery, such as ore and coke handling appliances, electric light, power transmission, compressed air and water pumps, elevators and hoists, pig iron casting machines, &c., there would be required per ton of pig iron per day nearly 2 horse-power per hour, or another loss of $576 \times 2 = 1152$ horse-power, or 115,200 cubic feet, of gas per hour.

Without further considering in this connection the possibility of heating open hearth furnaces, &c., with blast furnace gas, the power expressed in electricity which is daily obtainable is as follows:

	Cubic feet.	Cubic feet.
Blast furnace gas.....	3,600,000	
Less:		
Blast heating gas.....	900,000	
Blowing engine gas.....	400,000	
Furnace loss.....	180,000	
Cleaning gas.....	252,000	
Power gas (auxiliaries).....	115,200	
		1,847,200
Remaining for further utilization.....		1,752,800

The gas thus remaining when converted into electric power by gas engines gives 17,528 horse-power on the brake, and, allowing 10 per cent. loss for efficiency in the electric generators and transformers, $17,528 - 1752 = 15,776$ electrical horse-power, equivalent to approximately 11,760 kw.

It is now only a few years (1896-1897) since pig iron was placed on the New York market at \$10.50 to \$12 a ton. It is to be hoped that such times will not come again, but they should be remembered in considering the basic costs. The price of coke in large quantities delivered in the bins may be placed at \$3.50 per net ton. Iron ore under various conditions may be had at \$2.50 per ton; adding for lime, repairs, labor, &c., and maintenance another \$3.50, brings the cost of pig iron up to \$12 per ton, assuming that the plant is valueless after ten years. The cost per kilowatt is obtained on the basis of 24 tons of pig iron per hour, producing 11,760 kw. One ton of pig iron is thus equal to 490 kw., and as each ton costs \$12, 1 kw. costs $2\frac{1}{2}$ cents to produce.

Theoretically it may be said that pig iron is a by-product of the new improved gas producer, fired with coke and charged with iron ore as a flux for the ash and clinkers. The latter are melted down, however, thus avoiding the stoking, and characterizing the blast furnace as the best gas producer of larger size. The connection of a steel plant is desirable, because in it the coke oven gas may be used either pure or mixed with the blast furnace gas for heating the various melting and heating furnaces. The boiler is then entirely avoided, as all rolling mill engines run on gas, all auxiliary machines with electricity, and no other coal is supplied than may be required for the manufacturing of the coke for the blast furnace. This would constitute an electric plant using only plain coking coal and iron ore for power.

C. E. Irwin, formerly engaged in the mill and mining supply trade in Pittsburgh, has been appointed manager of sales for the Youngstown Steam Trap Company, Youngstown, Ohio, with offices in the Keystone Building, Pittsburgh, and will handle all sales for this company, which is putting on the market a steam trap for which strong claims are made for simplicity of operation and effectiveness.

The Steam Turbine Business Rapidly Growing.

That the steam turbine is rapidly increasing its foothold in the power field is evidenced by the remarkable increase in manufacture of the Westinghouse-Parsons type. During the six months ending June 30, 1905, the Westinghouse Machine Company, exclusive builder of the Westinghouse-Parsons type, has contracted for no less than 82,000 kw. in turbo-generating machinery, averaging nearly 1175 kw. capacity per turbine unit. These machines range in size from 200 to 7500 kw. The latter will be the largest turbines in the world, and three units of this size are under contract for Greater New York railway and lighting power stations. In the distribution of these machines among the various industries the electric railway has claimed the largest number of machines,

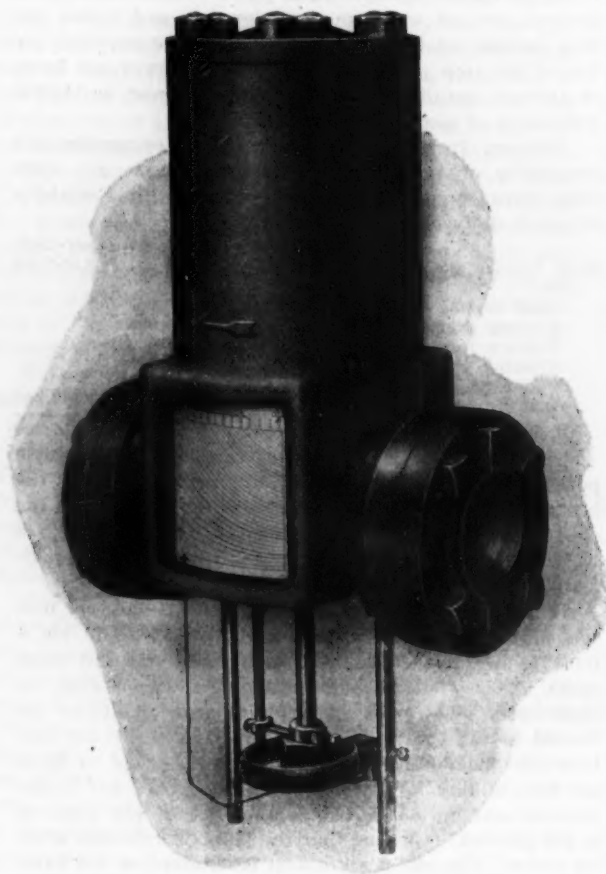


Fig. 1.—The Improved Sargent Steam Meter with Lower Bonnet Removed.

averaging 1496 kw. in capacity; next in order, industrial plants, averaging 571 kw. capacity, and light and power plants, averaging 1529 kw. capacity. In the order of total capacity, railway plants have required 38,900 kw.; lighting plants, 26,300; industrial, 12,000; miscellaneous, 4800. This statement bears excellent testimony to the increasing possibilities of the turbine and presages a brilliant future. The equipments noted represent actual sales only, not including contemplated business or partially closed contracts.

The Shenango Steamship Company has been organized at Cleveland, Ohio, to operate a fleet of ore carriers on the lakes. It is an identified interest of the Shenango Furnace Company, Pittsburgh, operating four blast furnaces at Sharpsville, Pa. An order for a lake boat for its service has been placed with the Great Lakes Engineering Works, Detroit, Mich., as noted in these columns some time since. W. P. Snyder, Pittsburgh, is president; Harvey H. Brown, Cleveland, vice-president; C. D. Dyer, Pittsburgh, secretary, and Henry Irwin, Jr., Pittsburgh, treasurer.

The New Sargent Steam Meter.

A description of the first form of the Sargent indicating steam meter was printed in *The Iron Age* December 15, 1904, in an abstract of a paper on the subject presented at the December meeting of the American Society of Mechanical Engineers. The indicating steam meter is a device for measuring and indicating the weight of steam flowing through it and is independent of the pressure. The accompanying illustrations show an improved form of the Sargent steam meter, which is now offered to the market. The instruments are calibrated by condensing and weighing the steam passed through them, so that their accuracy is assured.

Fig. 1 shows the exterior of the improved form of the instrument with the bottom bonnet removed. It is or-

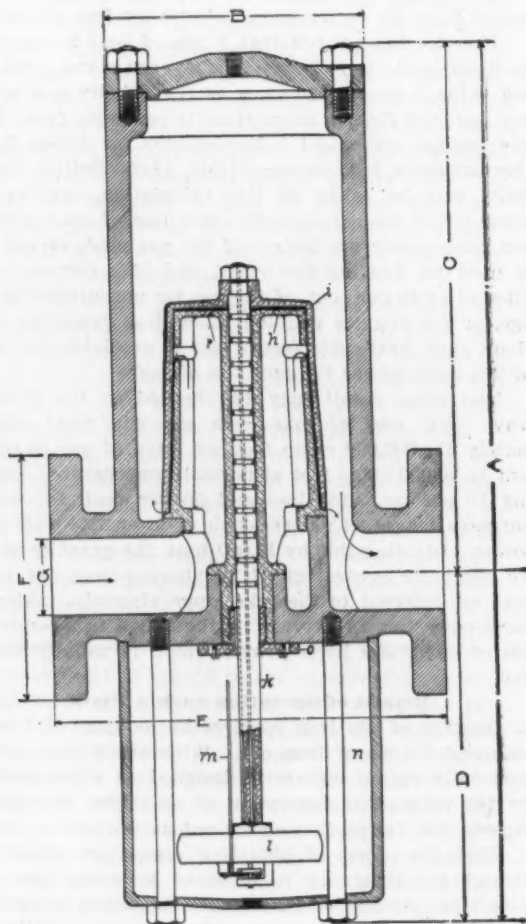


Fig. 2.—Cross Sectional Elevation of the New Form of the Steam Meter.

dinarly connected up directly in the steam line or in a by-pass, through which all the steam is normally passed, and indicates the weight of such steam by the position of the needle on the dial. The meters are made in right and left hand patterns, so that the dial may be on whichever side the purchaser prefers.

Fig. 2 is a sectional elevation of the meter, showing the path of the steam and the moving parts. Steam enters from the left, and, rising up around the valve stem guide, passes through the small hole *p*, and as the pressure increases raises the valve *i*, allowing the steam to pass down between the two cones and the valve seat to the discharge side of the meter. The valve stem *k* being open to the atmosphere, the pressure on the discharge side of the meter tends to close the valve and force it to its seat. As the area of the valve stem is about 2 per cent. of the valve area, it follows that there will be a 2 per cent. difference in pressure between the outlet and the inlet sides of the meter and that to maintain the difference the valve will assume new positions, depending on the quantity of steam flowing through. If the steam pressure were constant the rise of the valve

would be in proportion to the weight of steam flowing through, but as the pressure increases more steam will go through a constant opening; or, what necessarily happens, as the weight remains constant the opening will be less as the pressure increases. To compensate for variations in pressure a Bourdon spring, Fig. 3, is connected to the bottom of the valve stem, which moves the needle transversely as the pressure varies. With a constant weight of steam flowing through the valve would be open twice as wide for 50 pounds pressure as it would be for 100 pounds pressure; consequently the horsepower lines go down as the pressure goes up. The meter is calibrated by weighing the condensed steam flowing through under different pressures and valve openings, and the trial dial thus obtained is transferred to the

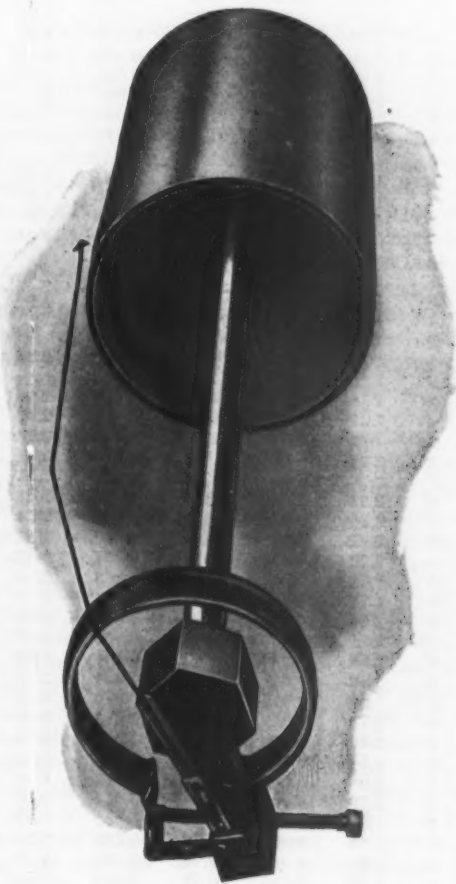


Fig. 3.—The Valve, Valve Stem and Spring.—The Only Moving Parts in the Meter.

permanent metal dial of the meter. As the meter has but one moving part it is not liable to get out of order.

The meter is manufactured in from 1 to 6 inch sizes by the Sargent Steam Meter Company, 1315 First National Bank Building, Chicago.

On the American side of Niagara Falls are at present three power stations, the aggregate output from which is about 150,000 horse-power. The three great stations on the Canadian side will have a total of 285,000 horse-power and two stations on the Welland Canal have at present 26,000 horse-power. This makes a total for the region of 460,000 horse-power, or more than 30 per cent. of the 1,488,000 estimated as the world's present equipment of hydro-electric power. It is expected that the three Canadian Niagara companies will add 120,000 to their present capacity, while provision has been made for doubling that of the Welland companies. The ultimate total comprised within present plans is therefore no less than 600,000 horse-power, of which it is estimated not more than 400,000 can be utilized in the immediate Niagara Falls region for a generation to come. It is evident therefore that if the present ambitious plans are carried into effect a considerable quantity of the available power will have to be transmitted a very long distance.

The Steel Forgings Customs Decision.

Formal notice was filed in the United States Circuit Court last week that Thomas Prosser & Son of New York will appeal from the recent decision of the Board of United States General Appraisers in the so called "steel forgings" case. The articles involved in the controversy were manufactured by the Krupps of Germany, and more than ordinary interest has been manifested in the issue, owing to the peculiar circumstances attending the case when it was before the lower customs tribunal. It seems that the importers maintained that the merchandise was of a character that warranted its being assessed at the rate of 35 per cent. ad valorem under the provision in the Dingley tariff law for "forgings." When the case first arose it was assigned to one of the subboards of the customs court for hearing and determination. The subboard was on the point of upholding the importer's contention when the protest was taken away from that body and given to another division of the General Board of Appraisers, which was determined to sustain the action of the Collector of Customs at New York in his assessment of duty at the rate of 45 per cent. ad valorem under the provision in the law for "manufactures of steel." It is felt by Prosser & Son that the court, in addition to finding the proper classification for the forgings, should also decide whether the Board of Appraisers was within its right in arbitrarily transferring the case from one subboard to another. The latter issue is one of general interest to importers in all lines and the ultimate decision will have wide application. It is probable that the Prosser case will be argued in the Circuit Court early in the fall.

In a decision written for the Board of Appraisers by I. F. Fischer a protest filed by F. A. Tasker of New York was sustained. It appears that Collector Stranahan exacted duty on certain octagonal steel rods at the rate of 45 per cent. ad valorem under the provision in the tariff act for "wire." In order to get possession of the merchandise the importer paid the duties demanded by the Collector and filed an appeal to the customs tribunal. General Appraiser Fischer finds that the Collector erred and that the importer should pay duty at the rate of but 2 cents per pound as "steel in bars." The Collector is directed to make a refund of the excess duties.

In another decision by General Appraiser Fischer the board upholds the action of the Collector in demanding duty on cast iron pipes at the rate of 4.10 cents per pound. The claim of the importer, the General Chemical Company of Chicago, for duty at the rate of \$4 per ton under the provision for "scrap iron" is overruled.

An Advance for Puddlers.—The first settlement under the new iron scale of the Amalgamated Association of Iron, Steel and Tin Workers was made at Youngstown July 13 between representatives of the association and the Republic Iron & Steel Company. While the average sales of bar iron on which wages are based showed a decline from 1.5 to 1.4 cents a pound, the puddling rate was increased for July and August from \$5.37½ to \$5.50 a ton. This was due to the advance made in the base of the puddling scale for the year beginning July 1. The scale for the finishers remains the same as last year, and under the settlement they will suffer a reduction amounting to almost 2 per cent.

T. P. Shonts, chairman of the Panama Canal Commission, says that the work on the canal will probably go on more rapidly than is expected, once it is fairly started. Concerning steam shovel operations he is quoted as follows: "Mr. Wallace estimated that we could work 100 steam shovels at Culebra cut. We have nine at work now. By the time we get 100 at work it will run us into 1907. You see you can't go into the market and buy 100 steam shovels just as you would buy 100 feet of hose. Then for every steam shovel three locomotives will be required. Thus, by the time we get 100 steam shovels we will need 300 locomotives, just for that great work at Culebra."

Pig Iron Grading by Analysis.*

The Method Followed by the Central Iron & Coal Company, Holt, Ala.

BY HAMBLEN BUEL.

A year or more ago the writer received from the American Foundrymen's Association a reprint from its "Journal" on "Methods of Determining the Constituents of Cast Iron." It was the result of long and very careful deliberation to arrive at a system of uniform methods for pig iron analysis. Needless to say the object was one deserving of the highest consideration and the support of all interested. However, I must say that I was at the time very forcibly impressed with one point—Would the adoption of such standard methods of pig iron analysis eradicate the differences met with among pig iron makers and consumers? While I do not criticise the adoption of standard methods of pig iron analysis, I believe the case should be thoroughly diagnosed before treating and then the proper remedy applied. The error into which so may fall is in believing that some road is better than no road. I believe that no road would be better, as then one would be inclined to be more careful. With the foregoing points in mind, the writer a few months ago undertook some investigations relative to differences in pig iron analysis. Our company decided about the first of the year to abolish fracture grading and grade all iron by analysis, virtually accepting the basis of grading as recommended by the American Society for Testing Materials.

Method of Handling Iron.

The handling of iron at our plant is somewhat different from the practice at most furnaces. In the first place, our iron yard is practically a continuation of the cast house and is traversed by a traveling crane with a span of about 60 feet. The columns supporting the runway of this crane are 25 feet from center to center. As soon as a cast has cooled somewhat the beds are carried out bodily and placed upon the iron yard, each cast being placed separately and marked with the cast number and date. The next day the cast is laid out upon the ground and broken by means of sledge hammers. The pigs are picked up by hand into steel boxes holding about 2 tons and dumped by means of a crane into blocks, according to analysis. These blocks are located between the columns of the runway and hold when complete 300 to 350 tons of iron. When a block is completed it is opened for shipment and the analysis computed from the analyses of the several casts entering into it.

The procedure in the investigation consisted of three steps: First, sampling each cast by the shot method, taking nine dips uniformly throughout the cast; second, taking a sample of six pigs from the same cast, and, third, sampling each car loaded from the respective mixtures. The nature of the investigation was such as to necessitate its extending over a considerable period, as a few isolated instances would be practically worthless. A complete record was kept of the cast analyses, both shot and pig samples, from January 25, when the furnace was blown in, to May 15, when it became necessary to suspend the investigations on account of the burning of our machine shop, where our pig samples were drilled. [This record of 368 casts accompanies the paper.—Ed.] Table A is a record of the mixtures of iron, showing the average upon both the shot and pig sample basis, together with the average of the cars loaded out of the respective mixtures, and embraces a total of over 16,000 tons of iron of all grades.

Variations in Silicon and Sulphur.

A tabulation of 368 casts, giving both the shot and pig sample analyses, showed that in 45.92 per cent. of the cases there was a variation of less than 5 per cent. in the silicon content of the shot and the pig samples of the respective casts; in 23.91 per cent. of the casts a variation of from 5 to 10 per cent.; in 21.19 per cent. of the

casts a variation of from 10 to 20 per cent., and in 8.97 per cent. of the casts a variation of over 20 per cent. Out of this total 31.25 per cent. showed that the silicon content of the pig sample was higher than in the shot samples.

The results of the sulphur contents were not nearly so gratifying, the shot sample yielding invariably lower sulphur than the pig samples. In 39.67 per cent. of the cases the difference was 0.01 or less, in 27.99 per cent.

Table A.—Analyses of Shot, Pig and Car Lot Samples.

Grade by silicon.	Lot No.	Average shot analysis.		Average pig analysis.		Average car analysis.	
		Silicon.	Sulphur.	Silicon.	Sulphur.	Silicon.	Sulphur.
1.25	1	1.19	0.079	1.15	0.117	1.31	0.122
1.25	2	1.04	0.063	1.05	0.082	1.21	0.080
1.25	3	1.19	0.063	1.20	0.093	1.20	0.073
1.25	4	1.33	0.039	1.30	0.038	1.33	0.056
1.25	5	1.26	0.049	1.28	0.083	1.51	0.050
1.75	1	1.91	0.072	1.88	0.091	2.01	0.111
1.75	2	1.87	0.061	1.89	0.087	2.07	0.080
1.75	3	1.70	0.040	1.57	0.057	1.94	0.056
1.75	4	1.76	0.043	1.79	0.052	1.77	0.060
1.75	5	1.71	0.023	1.75	0.033	...	...
1.75	6	1.69	0.024	1.68	0.027	1.91	0.040
1.75	7	1.58	0.038	1.52	0.045	1.80	0.065
1.75	8	1.85	0.018	1.82	0.026	1.81	0.040
1.75	9	1.85	0.025	1.84	0.031	1.91	0.055
1.75	10	1.97	0.041	1.90	0.050	...	...
1.75	11	1.81	0.029	1.80	0.034	1.63	0.044
1.75	13	1.93	0.036	1.97	0.034	1.83	0.049
1.75	14	1.72	0.024	1.72	0.025	...	...
1.75	16	2.08	0.062	2.01	0.074	...	...
2.25	1	2.33	0.048	2.34	0.053	2.33	0.054
2.25	2	2.18	0.120	2.20	0.132	...	...
2.25	3	2.18	0.044	2.15	0.058	2.19	0.060
2.25	4	2.21	0.039	2.05	0.051	2.32	0.046
2.25	5	2.22	0.047	2.43	0.059	2.23	0.081
2.25	6	2.27	0.027	2.23	0.028	2.38	0.032
2.25	7	2.26	0.017	2.15	0.022	2.51	0.022
2.25	8	2.21	0.028	2.15	0.036	2.43	0.069
2.25	9	2.26	0.034	2.25	0.034	2.34	0.037
2.25	10	2.12	0.033	2.19	0.039	2.11	0.044
2.25	11	2.26	0.032	2.20	0.037	2.27	0.038
2.25	13	2.28	0.055	2.19	0.088	2.24	0.076
2.25	16	2.23	0.044	2.25	0.049	2.07	0.039
2.75	1	2.86	0.037	3.01	0.048	3.05	0.051
2.75	2	2.80	0.036	2.66	0.054	2.75	0.052
2.75	3	2.86	0.031	2.47	0.044	2.56	0.035
2.75	4	2.82	0.021	2.97	0.024	2.76	0.028
2.75	5	2.66	0.025	2.37	0.040	2.61	0.040
2.75	6	2.73	0.027	2.64	0.033	2.60	0.042
2.75	7	2.82	0.026	2.49	0.043	2.57	0.045
2.75	8	2.84	0.021	2.72	0.036	2.85	0.030
3.00	1	2.96	0.069	2.79	0.075	2.89	0.083
3.00	2	3.18	0.060	3.06	0.077	3.10	0.064
3.00	3	2.96	0.050	2.92	0.062	3.07	0.064
3.00	4	3.12	0.052	3.06	0.073	2.96	0.069
3.00	5	2.89	0.044	2.76	0.054	2.75	0.047
3.00	6	2.88	0.044	2.87	0.058	2.92	0.052
3.00	7	3.14	0.033	2.77	0.033	2.80	0.034
3.00	8	3.04	0.024	3.04	0.028	2.88	0.035
3.00	9	3.07	0.021	2.92	0.025	2.84	0.031
3.00	12	2.90	0.046	2.81	0.067	2.74	0.081
3.00	13	3.03	0.039	3.09	0.064	2.93	0.082
3.00	15	3.45	0.061	3.09	0.084	...	...
3.00	17	3.03	0.023	2.92	0.037	2.73	0.051
3.00	18	2.92	0.027	2.61	0.048	2.53	0.040
3.00	19	3.25	0.047	2.98	0.059	2.81	0.060
3.75	1	3.75	0.033	3.62	0.046	3.57	0.041
3.75	2	3.69	0.029	3.67	0.042	3.76	0.036
3.75	3	3.75	0.027	3.49	0.044	3.35	0.046
3.75	4	3.90	0.035	3.43	0.063	...	...
3.75	5	3.84	0.036	3.67	0.052	...	...
4.25	1	4.27	0.035	4.16	0.040	4.24	0.036
4.25	2	4.12	0.038	3.79	0.061	4.09	0.045
4.25	3	4.27	0.028	3.93	0.029	3.87	0.052
4.75	1	4.75	0.040	4.38	0.046	4.39	0.041

the difference was between 0.01 and 0.02 and in 32.33 per cent. the difference was above 0.02. The writer has attempted to compare the result of this exhibit with the burdening, blowing, blast pressure, atmospheric humidity, variations in blast and gas temperatures, presence of water, and irregular furnace working, but in the absence of any very definite conclusions will not essay to present the comparisons in this paper.

Table A herewith is most interesting and comprehensive. I would call attention to the three different sets of average analyses, especially in respect to the silicon content. Out of 432 cars shipped and embodied in this exhibit a little less than 13 per cent. showed a

* Abstract of a paper read at the Atlantic City meeting of the American Society for Testing Materials, June, 1905. Mr. Buel is chemist of the Central Iron & Coal Company.

variation of between 10 and 20 per cent. above or below the computed silicon content of the respective mixtures, while about $2\frac{1}{2}$ per cent. showed a variation above 20 per cent. In every instance the discrepancy was traceable to mixtures containing casts which showed the wider variation in silicon content of the shot and pig samples. The method then in vogue of mixing was not sufficient to overcome this effect. To explain this: The outer wall of the block was from 8 to 10 feet beyond the perpendicular to the track of the crane runway. Thus in dumping the boxes of iron into the block they would lack five or six feet of reaching the outer edge of the block, making it impossible to distribute the iron as uniformly as desired throughout the block. A thorough discussion of the variations in sulphur is omitted, as I believe it wiser to try to solve one point at a time. Furthermore, the solving of the one question will help in the solving of the other.

Remedy in Better Mixing of Product.

The record of the 368 cast analyses corroborates the frequent experience of a single cast of iron varying widely in its silicon and sulphur contents. Some years ago the writer had occasion to investigate the variations and segregation of the elements and metalloids in iron and steel, and one instance came to his notice of a single half pig showing a variation of 1 per cent. (100 points) in silicon in the drillings taken from different parts of the half pig. If this be possible, where shall we look for a remedy—in the furnace or in the resultant product? A number of factors are involved in furnace operation, any one of which might be influential in effecting the variation of the silicon or sulphur contents of an individual cast, and all of which are beyond the furnaceman's control. The action of the iron in a furnace as it comes down from the zone of reduction into the hearth of the furnace might be compared, I think, with the action of dropping very gently into a vessel of molten substance of high specific gravity some molten substance of like specific gravity. The two will not become thoroughly mixed. If it were possible to devise some means by which the metal in the hearth of the furnace could be mechanically mixed the resulting cast would probably be found more uniform, except for the carbon, as this would still be affected by the difference in the chill.

On the other hand, if we were to look to handling of the resultant product for a corrective of the differences I believe we would be taking a more reasonable course. With this in mind the writer made a change in the manner of mixing the iron entering into the various blocks, though this was done at the expense of 5 or 6 feet of space on either side of the iron yards. So now the iron entering into any specific mixture is distributed evenly throughout the surface of the block, and a block when completed might present the appearance of a huge square layer cake of which the carloads are the slices.

The Kickdrive Circular Saw.

The principle of the Kickdrive foot power as manufactured by Slotkin & Praglin, 210 Canal street, New York City, for the driving of light machinery has been previously explained in these columns. The essential features are a foot lever connected with an internal segment gear, which meshes with a spur pinion mounted on the driving shaft and is connected with it through a clutch, so that its rotation in only one direction is effective. The driving shaft carries a balance wheel or heavy pulley, the momentum of which keeps the shaft in motion while the foot makes its idle return stroke. Frequently, as is the case in the machine illustrated, two drives—one for each foot—are provided, so that the active stroke of one covers the return stroke of the other and keeps up a more uniform turning effort. It also divides the work to the better advantage of the operator, as he may use both feet. As a rule it is not necessary to keep the feet constantly in motion; an occasional kick is generally sufficient to maintain the continuous rotating of the shaft. The frequency of the working strokes naturally depends upon the amount of power which it is desired to transmit.

The view herewith shows the Kickdrive applied to a small circular saw for light work. It is particularly intended for carpenters, cabinet and pattern makers and wood workers generally as well as engravers and electrotypers. It is described as very strong and substantial and capable of performing various kinds of work, including ripping, cross cutting, grooving, &c. A strong cast iron frame supports the saw table and all of the mechanism. The shaft is of steel and runs in adjustable boxes. It is claimed that the walking motion from which the foot power is obtained causes less fatigue than any other. The operator assuming a sitting position may use both feet or he may operate the machine standing, using only one foot. The proper tension is maintained on the belt by an idler, the position of which is adjustable.

Sometimes it is desirable to use a mill on the end of the circular saw shaft, and in such cases the shaft is extended for that purpose. The table may be raised by a screw, which may be seen in the engraving, and a lock nut is provided to clamp it in position. For chang-



The Kickdrive Circular Saw, Made by Slotkin & Praglin, New York City.

ing saws and for oiling the table may be tilted back clear of the moving parts.

Two 6-inch circular saws, one for ripping and one for cross cutting, are furnished with the machine, but a 7 or 8 inch saw may be used. It is also possible to use emery wheels up to 6 inches diameter and $1\frac{1}{2}$ inches face to good advantage on this machine. The usual gauges for guiding the work parallel to the saw or at different angles with it and for cutting various lengths are furnished for attaching to the surface of the table.

Following are the principal dimensions of the machine:

Size of table.....	26 $\frac{1}{2}$ x 28 inches.
Floor space.....	28 $\frac{1}{2}$ x 31 inches.
Height to top of table.....	37 $\frac{1}{4}$ inches.
Diameter of wheel.....	16 and 20 $\frac{1}{2}$ inches.
Maximum speed of saw.....	1650 revolutions per minute.
Approximate weight.....	155 pounds.

The grooved balance wheel on the end of driving shaft may be conveniently employed for driving small bench drills or emery wheels, which may be removably mounted on the saw table.

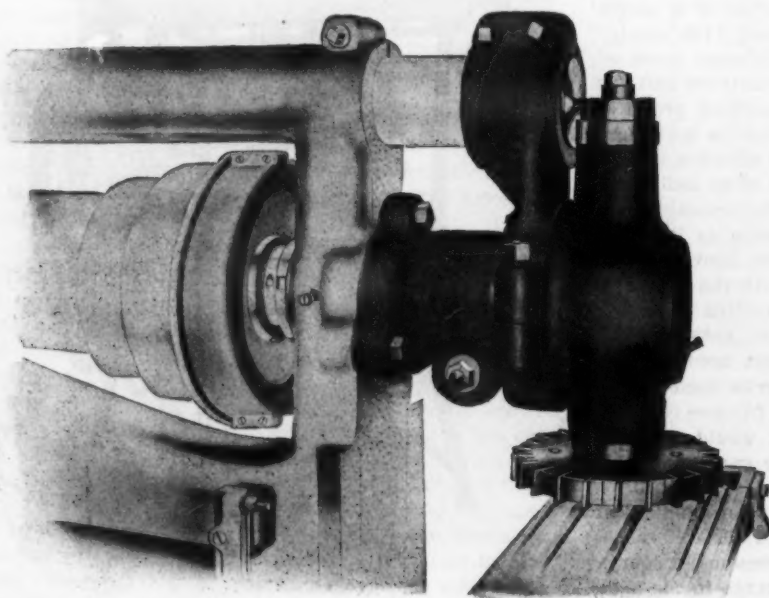
The S. Obermayer Company, manufacturer of foundry facings and supplies, Cincinnati, Chicago and Pittsburgh, announces the opening of an office at 120 Liberty street, New York. Edgar G. Seeman, who has represented the company at Pittsburgh for many years, has been placed in charge of the New York office.

The New Kempsmith Vertical Milling Attachment.

The illustration shows an extra heavy and powerful vertical milling attachment just brought out by the Kempsmith Mfg. Company, Milwaukee, Wis. It was designed primarily for strength and rigidity sufficient to handle without undue strain the heaviest vertical milling within the power of the main spindle. Thus in effect it converts a powerful horizontal miller into an equally powerful vertical miller.

The attachment, as the illustration shows, is compact and simply constructed. The bevel gears in the head have wide faces and coarse pitch and are of steel, case hardened. The vertical spindle runs in unusually long bearings to maintain perfect alignment, and delicate adjustment is provided for wear.

The head can be swiveled to any angle and is graduated in degrees to facilitate setting. Only two bolts are involved in adjusting and clamping the head securely at any angle, and these are conveniently located. For clamping the head in the bracket there is a friction bolt



New Vertical Milling Attachment, Made by the Kempsmith Mfg. Company, Milwaukee, Wis.

of an improved type which has exceptionally rigid clamping power.

The vertical spindle has a taper hole and is threaded for large face milling cutters, both the hole and the thread being identical with those of the main spindle, thus making all tools interchangeable. Drawbolts are furnished for drawing in and backing out end mills. The distance from the center of the horizontal spindle to the nose of the vertical spindle is very short, so as to admit unusually high work between the cutter and the table.

The attachment is drilled to the same jig as the columns of machines for which it is intended, so that it can be applied to any Kempsmith miller of certain sizes now in use. The attachment is made in three sizes.

The Valuation of Waste Gas.*

The question of correctly estimating the value of gas obtained as a by-product in metallurgical processes is one of increasing practical interest. In discussing the utilization of such material and the profitability of plants the view is often expressed that its value should be ignored, which view is indeed justified by a superficial examination. Blast furnace gas, for instance, at first sight seems but an unavoidable minor product, not purposely produced, but existing whether or not there is any use for

it. The most natural conclusion is, therefore, to set its value as nothing.

Let us, however, examine this question from another point of view. In a modern blast furnace plant the gas is a product which in civilized countries has a value which can be capitalized. Even if the works producing it are unable to utilize this source of power to the utmost a profitable use for it would not be hard to find, especially in view of the fact that there may be a wide choice of location. The power converted into electricity may be conducted many miles and put to multifarious uses. Almost every town has electric light, electric railways and numerous consumers for this cheap source of power, and even where such disposition is not available a plant may be built especially to utilize it. Should not, therefore, this gas, produced as a minor product, be compared with water falls, which are greatly prized as sources of power and the value of which is generally placed sufficiently high? Unused or badly used gas and unused falls of water represent values, the idleness of which is equivalent to noninterest bearing capital. It may be conceded that water power is still cheaper than that of fuel gas on account of lower operating cost and lower interest charges in the case of a turbine plant. A comparison, however, of the total costs of installation of a turbine plant and a fuel gas plant respectively would probably show figures not so very far apart, especially when the cost of the canals is taken into consideration.

Suitable water powers are, in civilized countries, at the present day, thanks to the simplicity of the installation, made to yield the greatest possible amount of power. Even the enormous cost of turbines to utilize part of the energy of Niagara and the Falls of the Rhine at Schaffhausen has not prevented their installation. In both cases consideration was given to the increased expense imposed by miles of cable and the loss of current entailed thereby. A source of energy equal in value to these falls is represented by fuel gas. The ideal method of utilizing the latter would of course be at the works where it was produced.

Increasing competition in the iron business and the continually greater perfection and use of large gas engines make it certain that in future a rational use of the gas will become absolutely necessary. When this time comes, in order to show low production costs furnaces will have to charge part to the fuel gas. This is only right, for, like the iron, the gas has a market value, as the power it contains may be used in the works to decrease the operating costs or sold to outside parties. Certain works have been pioneers in the utilization of their furnace gas by means of gas engines. Among them are the Ilse-Peine Works, which will shortly be driving all its rolling mills at Peine by electricity generated by gas engines at Ilse. Other works will follow, and when such practice becomes general a valuation of the gas obtained as a by-product must be made. A part of the operating cost will be charged to the gas in order that the iron may be better able to compete in the open market, as the gas, like the iron, has a value which may be determined. In order to set a value on the gas comparison might be made with its heating value as compared with coal, or, still better, with coke. This would be justified, as it nearly corresponds to the actual cost of production of the gas, which, for its formation in the furnace, consumes an amount of coke corresponding to its thermal value.

The office force of the Republic Iron & Steel Company will be moved from Chicago to Youngstown, Ohio, about August 15.

* From Herr Geldmacher in *Stahl und Eisen*.

Lake Ores Shipped to Pueblo, Colorado.

The Colorado Fuel & Iron Company has bought about 100,000 tons of Lake Superior ores for shipment to the company's blast furnaces at Pueblo, Col., through the remainder of the year. The ore will come from the Stevenson mine at Hibbing, Minn., of Corrigan, McKinney & Co., which produces one of the best ores of the Mesaba range—among the highest in iron and lowest in phosphorus. A statement by the Colorado Fuel & Iron Company given below explains the conditions which made advisable the purchase of ore for so long an all rail haul:

The demands upon the Colorado Fuel & Iron Company for its iron and steel products at the present time are so large in volume that its available supply of ore is inadequate to meet these requirements, though its mines now in operation are producing largely in excess of any past records and the resultant output of iron and steel from its Minnequa plant is correspondingly greater than at any time in its history.

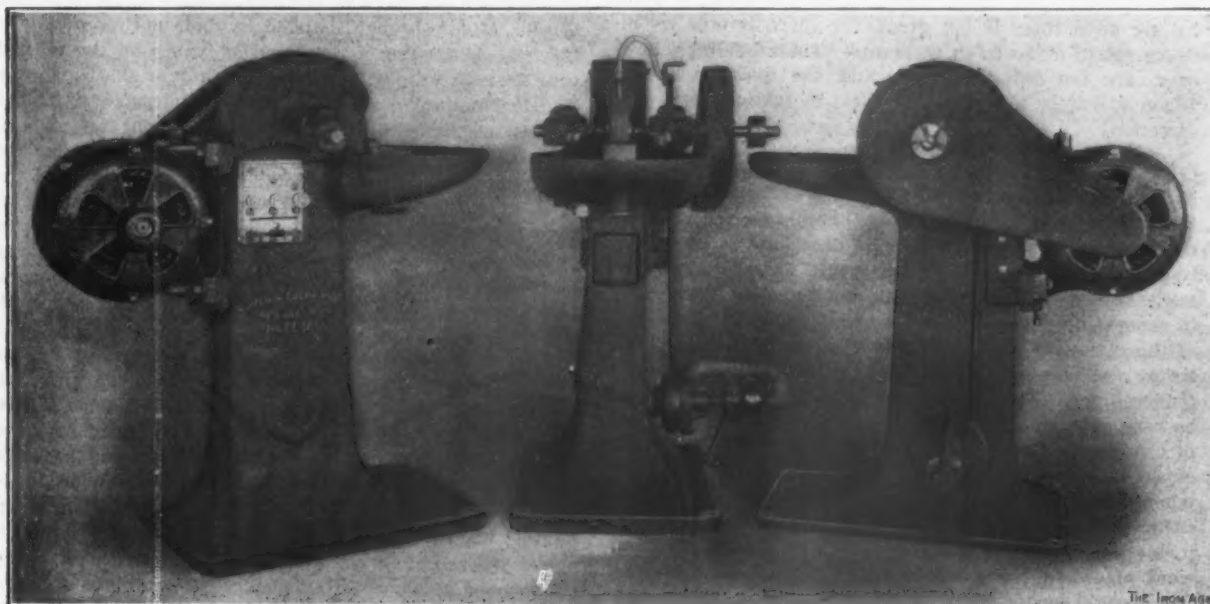
The company during the past year or two has been assiduously examining deposits of ore located at various points throughout the Central Western region and has found encouragement in the existence of iron bearing sections which give promise of available sources of supply for years to come. The location where it has found the

taining 64 per cent. iron and 0.038 per cent. phosphorus, shipments of which began early in July from the Stevenson mine, to be followed during the time above mentioned by 600 or 700 tons daily.

The unfortunate conditions existing in the Rocky Mountain district are such that any unusual or even ordinary demand must be met by developing or creating the supply. There exists no nearby market where the consumer can seek from a producer who is ready and anxious to furnish promptly ores of satisfactory quality and quantity. As an illustration it might be stated that the Stevenson mine produced last year 1,600,000 tons of ore and as much as 17,000 tons has been shipped in a single day, and no part of it was used by the owners of the mine, but was sold entirely to the public.

A Gould & Eberhardt Electrically Driven Grinder.

Three views of a 14-inch water tool grinder made by Gould & Eberhardt, Newark, N. J., and equipped with motor drive are shown in the accompanying half-tone. An order for 41 of these tools was recently filled for the Japanese Government. The motor is designed to run on 60-cycle three-phase alternating current at a pressure of



Three Views of an Electrically Driven Grinder, Built by Gould & Eberhardt, Newark, N. J.

largest body of Bessemer ore within easy reach of existing and nearby transportation facilities is at its Chicago property, 2 miles north of its Sunrise mine and about 9 miles from the Burlington tracks at Guernsey, Wyo. Prospecting has been actively conducted upon this property during the past year and by means of drifts, shafts and numerous diamond drill holes the location of a large body of high grade Bessemer ore has been found, carefully outlined and exactly defined. An experimental shaft to verify the information obtained from the diamond drill holes has been driven through it and the results shown were so satisfactory that actual development has been commenced of a mine consisting of a first-class three-compartment shaft, now being driven day and night and which upon completion will be equipped with modern hoisting machinery.

The Burlington System is constructing a branch line with terminal yards and ample shipping facilities and it is expected that shipments will begin about August 1. But the time required to open up properly the underground workings, to introduce 500 or 600 miners and operate the mine to full capacity will be so great that the Colorado Fuel & Iron Company has found it necessary to cover its additional requirements during the balance of the present year by the purchase of a large block of high grade Lake Superior Bessemer ore con-

200 volts and is connected directly with the grinding wheel spindle by a Morse silent chain inclosed in a guard. The method of mounting the motor allows for adjusting to compensate for any stretch that may take place in the chain.

As may be seen from the middle view the bearings of the wheel spindle are extra wide and they are also self oiling. The wheel is particularly adapted to this machine and consists of a special composition which though coarse in texture grinds very fine and very rapidly without burning the tool. With a fine wheel there is a greater tendency to heat the tool, because the surface does not retain much of the cooling water.

The frame or base of the machine forms a water tank. A centrifugal pump is attached to the base, being driven by belt from a small pulley on the extension of the wheel spindle, and delivers the water through a pipe and flexible hose. The pipe near the junction of the hose contains a valve which regulates the flow to the desired amount. As the water falls from the wheel it is caught in a skimming pan and is there freed of floating substance and sediment which would otherwise pass through the pump and be likely to cut the bearings and wearing surfaces.

The wheel is 14 inches in diameter by 2 inches face and is designed to run at 340 revolutions per minute.

British and Continental Iron Trade.

The Half Year in Great Britain.

LONDON, July 8, 1905.—In the first half of 1905 the prosperity anticipated with the close of the old year was not realized. There have also been complications, notably the corner in warrants, about which readers of *The Iron Age* have been well informed, the high point reached being 55 shillings, from which there was a rapid descent in May to 45 shillings 6 pence. Nor is there any sure indication by which future events may be gauged. There was very little movement in prices in June. Prices remained steady, but the steadiness appears to be the result not of confidence but rather of dullness and indifference. It seems likely that less iron changed hands during June than was the case in any of the dull months which succeeded the winter improvement. The speculative market has been unprecedentedly steady, prices of Cleveland warrants and standard warrants in London being quoted without any alteration for a whole fortnight.

The chief point of interest in the pig iron trade recently has been the attitude of the holders of the Cleveland warrant stock. They appear to be willing still to buy any stray warrants that may be offered at or below 45 shillings 6 pence, with a view to keeping the market at that figure for the present. And the extra burden falling upon them is not great, for there is now no inducement to make fresh warrants. Their holdings, however, are not being reduced, and the question arises, When will it be necessary for them to take steps in this direction?

Sheffield Trade in Heavy Material.

In Sheffield during the half year certain of the heavy industries have afforded better employment, and although the orders can scarcely be described as of magnitude they have provided fair work for the men. In military material a considerable improvement is reported in several departments. Armor plate making is not one of them, the old work having reached the finishing stages before the new Admiralty requirements have been even tendered for. These requirements will not be found to be very extensive. Sheffield no longer enjoys a monopoly of armor production, and in the further orders now daily expected will have to share with its competitors elsewhere. In round figures the Sheffield armor plate establishments are able to manufacture at the rate of 30,000 tons per annum. It is not too much to say that all the work placed by the Admiralty with these firms in recent years could easily have been taken care of by a single establishment. The close of the war is expected to bring important work to most of the heavy industries. There are signs of increased activity in railway material, foreign and colonial requirements affording more encouragement. At home the railway companies, with few exceptions, have long been ordering from hand to mouth, but that is a condition of affairs which cannot last forever, and increasing traffic would soon compel increased provision for rolling stock and other essentials of the railway business.

A Good Record for Shipyards.

The shipbuilding figures for the half year on the Clyde, Forth, Tay and Dee show that the six months have produced a record amount of tonnage, surpassing the previous record—that of 1902—by 55 tons. The month of June adds to the five months' total 29 vessels, of 48,225 tons, making the half year's figures 160 vessels, of 259,860 tons, as compared with 201,633 tons in the corresponding period of last year and 259,804 tons in 1902.

As to general trade prospects there has been during the month considerable activity in the steel trade, caused by specifications coming forward pretty freely for material for ships ordered recently, and some of the steel works are being pressed for early delivery. This, however, is explained by the proximity of the holidays and does not indicate an improvement in trade. There has been no material change in the freight market and there is no sign of any in the near future.

The German Steel Syndicate and the Merchant.

Great interest is being evinced in the struggle between the German Steel Syndicate and the merchants. Some months ago the German Trust determined to sell direct to the consumer, leaving the merchant out of account. This was not so easy as it looked, bearing in mind the fact that several merchants had long contracts, while others were able to compete in price with British products. Nevertheless, slowly and surely the German Trust has been getting closer to the consumer. Whether this course has been economically successful is not certain. The change has meant the abolition of the credit terms to which consumers are accustomed, and this is checking the amount of business which goes to Germany. It is difficult to reach any sure conclusion as to the exact results of the operations of the United States Steel Corporation in Great Britain. Its policy appears to be to keep open the old channels of trade by supplying in reasonable quantities and generally by keeping in touch with the market. So far as I can hear, contracts made with the Steel Corporation, if fairly numerous, are on a small scale. Meantime there is a movement among the merchants to come closer together in protection of their interests.

Labor Difficulties.

Labor difficulties are cropping up in various parts of England and indeed of Europe. Last Saturday a number of workmen employed at Dorman, Long & Co.'s Britannia Works, Middlesbrough, handed in their notices owing to the firm demanding a reduction of wages on the ground that the men were being paid more than at similar works. The Britannia Works have recently undergone extensive alterations, American and German equipment having been introduced in order to bring the mills up to date for the rolling of steel girders and shipbuilding material and the production of wire rods and sheets. Before the alterations nearly 600 men were employed in these departments, and on the mills being closed down an intimation was given the workmen that on the alterations being completed the works would be restarted under new conditions.

One hears also of growing dissatisfaction among the tin plate workers in South Wales, while the situation in Germany appears serious. In Bavaria some 25,000 metal workers of Munich, Augsburg and Nurnberg have been locked out. The dispute has arisen over the question of hours—the workmen asking for a nine-hour day—and the rate of pay for piece work. In Rhenish Westphalia, where the great coal strike but recently took place, differences in the building trades have resulted in the lockout of about 30,000 men. The gradual extension of the strike area in Germany is significant as showing a determination among German workmen for shorter hours.

Admiralty Tenders.

The tenders for the new 36-knot destroyer were sent in to the Admiralty yesterday. Only four shipbuilders have quoted, owing to the stiffness of the conditions: The Fairfield Company, Govan; Cammell, Laird & Co., Birkenhead; Armstrong, Whitworth & Co., Newcastle, and Hawthorn, Leslie & Co., Newcastle. The specifications for the new armored cruisers are expected to be issued by the end of this month. These vessels are to be the fastest and most powerfully armed of their class in the world, as the intention is presumably to beat the speediest foreign battle ships in every point except perhaps in armor. Their speed is to be 23½ knots. The specified horse-power of their Babcock and Wilcox boilers is 35,000. The machinery is to be of the turbine type.

Turbine Developments.

Escher, Wyss & Co., Zurich, who have been making hydraulic turbines for more than a century, have recently brought out a new form of "action" turbine, designed by their director, Heinrich Zoelly, in which the motive power is obtained by the direct impact of steam jets moving at a high velocity against the vanes of the revolving wheels. Heinrich Zoelly claims, and the published tests made by Professor Stoldola of the Zurich Polytechnic corroborate the claim, that in turbines of this

design the economy is as great as in any other form of turbine and that this result is obtained with a more substantial mechanical construction and fewer parts. A syndicate has been formed in Germany, consisting of Messrs. Krupp of Essen, the Maschinenfabrik of Nuremberg and Augsburg, the North German Lloyd, Escher Wyss & Co. and the Siemens-Schuckert Company for constructing the Zoelly turbine for marine and other purposes in Germany and elsewhere on the Continent. A similar combination has been made in France under the leadership of Messrs. Schneider of Creuzot. In England a syndicate has been recently formed, consisting of Escher Wyss & Co., A. G. Schiff & Co. and Mather & Platt, Limited, of Manchester, for the construction and sale of the Zoelly turbine in the United Kingdom and British colonies and for granting licenses under the Zoelly patents. Already Escher, Wyss & Co. and their various licensees have over 30,000 horse-power of turbines at work or under construction, including several for marine propulsion.

Prussian Manufacturers and Their Competitors.

A circular letter has been issued in Prussia to manufacturers and their agents warning them against giving information of the condition of the markets and of manufacturing interests in their reports to the press, &c. The following is an extract from the letter: "The reports in our technical and trade papers are most assiduously studied abroad and by representatives of our foreign competitors residing in Germany. . . . The articles published in our journals and trade papers should not state the selling prices of our manufactured goods, how their cost compares with that of similar goods produced in competing countries, of what ingredients the articles are composed, what the tariff rates are, &c. Such detailed reports, which often expose even the secrets of manufacturing, form an excellent weapon in the hands of our competitors and serve to injure German business interests. All public reports should refrain from giving details. No complaints about bad business should be published, as this is hurtful to our export trade." The circular suggests that German factories be kept closed to foreigners.

S. G. H.

The Diescher Shaft Coupling.

One of the latest developments in the line of shaft couplings is one recently brought out by the Republic Engineering Company, Pittsburgh, Pa., known as the Diescher shaft coupling. A glance at the accompanying illustration will indicate the extreme simplicity of the device. It consists of two elements, a cast iron shell cored out so as to leave two interior compartments divided by a central rib, and a coil, the tangential ends of which are threaded and project through lugs in the

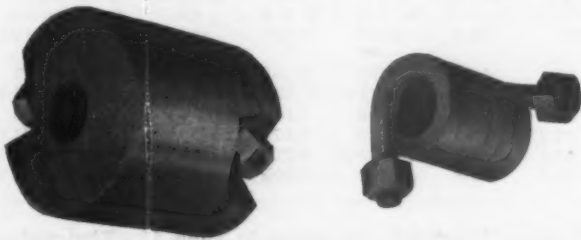


Fig. 1.—The Diescher Shaft Coupling and the Gripping Coil.

shell so that the coil may be tightened by drawing up nuts on the ends of the coil. In the casting the shell is cast over the coil, which firmly unites the central web on the casting with the center of the coil. This makes the coil and shell one piece, and all machining such as boring and facing is performed with the device in that condition.

Fig. 1 shows the complete coupling and the coil before the coupling is cast about it. Fig. 2 gives a longitudinal and cross section, showing the shape of the shell and the location of the coil.

The coupling being placed on the shaft it is only

necessary to tighten the nut on each end of the coil until the latter grips the shaft all around and over the full length of the part covered by it. The powerful grip of the spiral coil on the shaft will be readily understood by any one who has observed the pull that a rope passed a few times around a windlass is capable of exerting. In one instance when one of these couplings was tested the grip on the shaft was so powerful that the shaft was twisted off, while the coupling still held the joint.

Some of the special advantages claimed for the Diescher coupling are that it is the only one-piece coup-

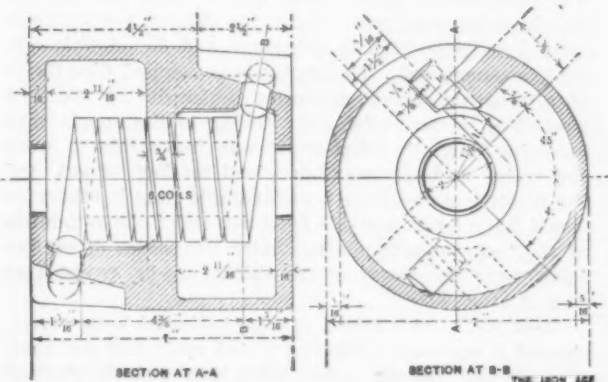


Fig. 2.—Two Sections of the Diescher Coupling.

ling on the market; requires no keys, keyways or bolts; holds the shaft in permanent alignment; is in no way loosened by reversing the shaft; will hold securely two sections of shafting differing slightly in diameter; has a smooth exterior surface, with nothing to catch fingers or clothes; is the only coupling made that has a powerful grip on the entire circumference of both sections of a line of shafting; grips them the harder the greater the load on the shaft, and in transporting and storing there are no parts to get lost. The smooth and uniform exterior surface makes the coupling a convenient one to handle.

The Michigan Central Railroad Company announces that the construction of the Detroit Tunnel Line from Windsor, Ont., to West Detroit Yard, Mich., including the electrification thereof, is placed in charge of an Advisory Board of Engineers consisting of William J. Willgus, vice-president of the New York Central & Hudson River Railroad; Howard Carson, consulting engineer, and W. S. Kinnear, chief engineer of the Tunnel Company. The chief engineer will be in direct charge of construction, reporting to H. B. Ledyard, chairman of the Board of Directors, on executive and financial matters and to the Advisory Board of Engineers as to plans, specifications and methods of doing the work.

The new ore freighter William A. Rogers, launched at the Lorain, Ohio, yard of the American Shipbuilding Company on July 8, is named for the well-known Buffalo resident partner of Rogers, Brown & Co. The vessel is built for the Niagara Transit Company and its cargoes will be in part ore from the properties of the Niagara Iron Mining Company of Michigan and the Rogers Iron Mining Company of Minnesota, of both of which companies Mr. Rogers is president. The William A. Rogers is 545 feet over all, 504 feet keel, 54 feet beam and 30 feet deep, and will carry 10,000 tons of ore.

For the first six months of 1905 the *Railway Age* reports that five railroads, representing 270 miles and a capital of \$7,830,000, went into receivers' hands, a better showing than for the first six months of 1904, when receivers were appointed for six roads, with 302 miles of lines and \$10,514,000 of bonds and stocks. The first six months of 1903, 1902 and 1901 were still more noteworthy for the small number of railroad insolvencies.

Large German Gas Engines.*—IV.

A Test at the Phoenix Works.

The following data, obtained from tests made on Nuremburg gas blowing engines at the Phoenix Works, Ruhrort, represent their average working, no special preparation having been made. The tests were undertaken shortly after the engines were started for the purpose of coupling up the generators in parallel and to determine the gas consumption and mechanical efficiency at various loads. The heating value of the gas was ascertained by means of a calorimeter and also by analysis, while for measuring it a large gasometer of 35,000 cubic feet capacity was used. Indicator diagrams were made from both sides of both cylinders and the electric output was measured. The engine was coupled directly to an alternating current generator, which during the tests worked on water resistance. Owing to the supply pipe becoming partially stopped it was impossible to work the engine up to its maximum load for lack of gas, and the result was therefore less favorable than it otherwise would have been, but this does not affect the reliability of the tests actually made. After two series of preliminary tests the result of the third may be accepted as correct.

Test No. 3, with a load of 1020 indicated horse-power, showed a gas consumption of 75,184 cubic feet per hour, the average heating value being 105 British thermal units per cubic foot, corresponding to 7739 British thermal units per indicated horse-power hour.

Test No. 4, with 1090 indicated horse-power load, showed a gas consumption of 7936 British thermal units per horse-power hour. In this experiment the inlet pipe showed a vacuum of 4 inches.

certain whether it would be more advisable when running on a light load to divide it between the two cylinders or to cut out one of them altogether. Test No. 10 showed, when using only one cylinder with a load of only 568 horse-power, the same gas consumption per horse-power hour as when running at a maximum load.

Tests at the Rombach Works.

A further series of tests was made at the Rombach Works with blast furnace gas blowing engines, also built by the Nuremburg Machine Works. The engines were of double-acting two-cylinder tandem type of 33.46 inches diameter and 43.31 inches stroke. At these works the furnace gas, after undergoing a preliminary cleaning, passes through a Theisen centrifugal gas cleaner, which it leaves with a pressure of 2.4 to 3.1 inches, while the temperature of the gas at the engines is between 25 and 30 degrees C. The gas was measured in the same way as in the Ruhrort tests, every possible precaution being taken to obtain correct readings from the gasometer. The load on the engine during the test was obtained by means of water resistance, which was held constant when the readings were being taken, which was done every two minutes, the engine being indicated simultaneously. The results obtained are, therefore, based on a gas consumption measured volumetrically and a load measured electrically, the most reliable methods possible.

In all nine tests were carried out, of which one, however, was ignored, doubt existing as to the correctness of the reading at the gasometer. The others gave reliable values for the gas consumption at varying loads, the mechanical efficiency, &c. The tests were carried out without interference to the operation of the plant, and the results, therefore, represent average working condi-

Table I.—Summary of Data from Ruhrort Tests.

Average pressure						Heating		Load	
Number of test.	Duration of test. Minutes.	Revolutions per minute.	in cylinders, Pounds per square foot.	I. H.-P. of both cylinders.	Gas consumption.		value of 1 cubic foot gas.	Heat used per H.-P. hour.	on engines. Per cent. of maximum capacity.
					Per hour. Cubic feet.	Per H.-P. hour Cubic feet.	B. T. U.	B. T. U.	
VIII.....	36	104.4	54.4	781	62,683	80,340	102	8,214	60
IX.....	36.4	102.3	35.1	491	73,984	150,793	104	15,793	30
X.....	50	103.1	80.2	568	42,023	73,983	105	7,777	40
XI.....	20	101.0	77.0	1,068	83,519	78,221	105	8,214	90
XIII.....	27	100.8	77.2	1,070	83,519	78,045	104	8,293	90
XIV.....	25	102.0	77.4	1,085	84,578	78,045	106	8,293	90
XVI.....	27	102.2	76.9	1,080	81,753	75,748	104	7,896	90
V.....		103.2	79.9	1,130	.....	.....	.....	.....	..
VII.....		104.2	81.4	1,160	.....	.....	.....	.....	..
XII.....		100.9	81.7	1,130	.....	.....	.....	.....	..
XV.....		102.1	80.0	1,120	.....	.....	.....	.....	..

Table II.—Summary of Data from Rombach Tests.

Test number.	Duration of test. H. M.	Revolutions per minute.	Average pressure. Pounds per square inch.	I. H.-P. of both cylinders.	Per hour. Cubic feet.	Gas consumed.		Heating value of gas at 33° C. Per cubic foot. B. T. U.	Heat used per hour. Per I. H.-P. B. T. U.	Per brake H.-P. B. T. U.	Output of dynamo. Kw.	Load on engine. H.-P. Per cent.	Efficiency of gas engine. Per cent.
						Per hour. Cubic feet.	Per I. H.-P. hour. Cubic feet.						
I.....	33	106	60.9	580	58,692	101	88.5	9,103	19,721	158.3	280	48.5	
(1 cylinder)													
III.....	28	105.8	42.5	807	76,632	95	88.5	8,452	12,261	357.1	557	69	
IV.....	29	106.3	60.1	1,146	105,167	91.5	89.4	8,214	10,793	583.7	871.5	76.1	
VI.....	26 50	106.5	68.7	1,312	113,853	86.9	89.8	7,829	9,920	698	1,037	79	
VII.....	25 51	106.1	71.4	1,359	118,530	87.2	90.7	7,936	9,673	755.25	1,115	82.1	
IX.....	25 51	105.8	73.1	1,388	118,530	85.5	88.9	7,619	9,226	776	1,147	82.6	
V.....	25 20	105.6	75.3	1,427	120,705	84.6	87.9	7,460	9,005	803	1,186	83.1	

The results are shown more completely in the diagrams, Fig. 28, and Table I. The gas consumption when working with a sufficient load (over 60 per cent.) is equivalent to between 7777 and 8293, the average being approximately 7936, British thermal units per horse-power hour. The mechanical efficiency showed an average of 84 per cent, the gas consumption per brake horse-power hour 9444 British thermal units, although, as mentioned, the maximum load could not be obtained. Tests with lighter loads resulted as follows: At 830 to 780 indicated horse-power distributed on both sides of both cylinders the gas consumption represented 8214 British thermal units per horse-power hour—4, e., approximately the same obtained with a load of 1000 to 1100 horse-power. Further tests were undertaken to as-

tions. The details are shown in Table II. The mechanical efficiency of the engine amounted to 87 per cent, the work of suction to approximately 4 per cent. of the maximum load, and the gas consumption of the engine per horse-power hour was about the same as in the case of the Ruhrort experiments, or between 7539 and 7936 British thermal units. The determinations of heating values were made at the same time as the volumetric readings at the gasometer and while the indicator diagrams were being made by means of a calorimeter and by analysis. The latter method in every case has a rather higher value than the former, the difference amounting to as much as 120 British thermal units. The no-load diagram, Fig. 29, with only one side of the cylinder in operation, was made at the beginning of the tests, the resistance of the engine itself, which was not

* Continued from page 86 of issue of July 13.

yet warmed up, being in consequence too high. Such diagrams should be made at the end of a series of tests.

Conclusions.

The development of the modern gas engine is notable by reason of the fact that owing to the advances, both mechanical and otherwise, described in the foregoing, the gas consumption, which was as much as 106 cubic feet of coal gas in the earliest engines, has been reduced to 14 cubic feet per indicated horse-power, while the percentage of the effective work obtained from the fuel used has increased from 4 to about 30 per cent. The most important advances in recent years have been the development of engines for poor gas, the introduction of high degrees of compression and high combustion pressures and the development of large four-cycle engines.

The use of the gas engine in large units, independent of outside sources of energy, was made possible by cheap fuel gas. The cheapest obtainable are the waste gases

the two-cycle engines were the engines of the future. This has acted unfavorably on the development of the four-cycle system, which resulted in its halting for a long time in the uncompleted form of a single-acting engine. Only in quite recent times has the four-cycle engine been developed in its correct form, as a double-acting machine with more than one cylinder, which is due to the efforts of the Nuremburg Machine Company.

(THE END.)

An Oil Vaporizer for Gas Engines.

In connection with its regular gas and gasoline engine the St. Marys Machine Company, St. Marys, Ohio, uses a vaporizing attachment where it is desirable to run the engine with crude oil or kerosene instead of gas or gasoline. Liquid oil is injected into the vaporizer, where it is heated by the exhaust of the engine and con-

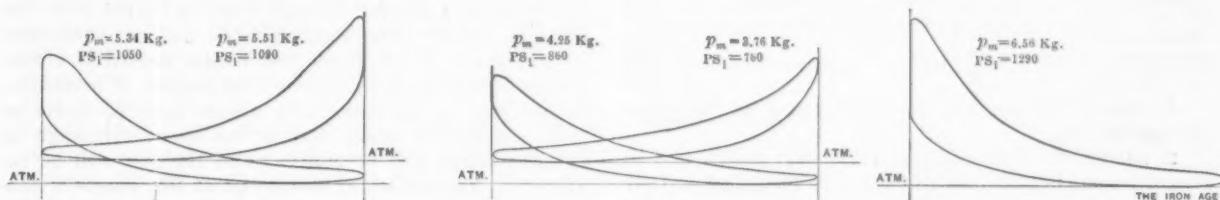


Fig. 28.—Diagrams of 1000 Horse-Power Blast Furnace Gas Blowing Engine of Phoenix at Ruhrort.—Two Cylinders, 780 and 1000 mm.

of industrial works, such as blast furnaces, coke ovens, &c., the direct use of which gave the impulse for the development of large internal combustion engines and at the same time opened a wide field of usefulness for them. The calculation was convincingly clear that with the waste gas of, for instance, a 150-ton blast furnace used for heating boilers and raising steam only 1500 horse-power could be obtained, while a gas engine would yield 4000 horse-power, and for every ton of iron about 7000 cubic feet of gas for power purposes would be made available.

The first practical experiment with blast furnace gas (1894 in Scotland) with an engine of 12 horse-power was followed in 1895 with experiments with a 12 horse-power engine at Hoerde, and simultaneously at Seraing with a small 4 horse-power Simplex engine. In 1896 experiments were made at Hoerde with a 120 horse-power two-cycle Oechelhaeuser engine, originally constructed for coal gas, which were followed in 1896 by the first decisive step toward the introduction of large gas en-

verted into gas for the supply of the engine. The arrangement is such that the crude oil is prevented from reaching the cylinder and corroding the rings and valves.

The vaporizer is of simple construction, consisting of a vertical cylindrical chamber surrounded by a shell, with an annular space between through which the exhaust gases from the engine pass. The inner chamber contains about 20 horizontal cast iron plates, which are connected with the walls of the chamber so that the heat of the exhaust gases is communicated to them. Alternate plates have openings at their centers and the intermediate plates openings at their edges. Oil being introduced at the top flows down by gravity over the plates, following a tortuous path. The heat of the plates causes the oil to be raised higher and higher in temperature until practically all of it is gasified. Any oil which reaches the bottom without being evaporated is returned to the oil tank and repassed through the apparatus. Before starting when the vaporizer is cold it is necessary either to use gasoline in the engine until the vaporizer becomes heated up or to apply heat in the bottom of the chamber for some 20 minutes or so until the vaporizing action has been established.

The advantage of using crude oil may be readily appreciated when it is considered that this fuel can be purchased for from 1 to 5 cents a gallon, depending upon the distance of the locality from the oil regions. Another advantage is that the fuel can be handled with greater safety than gasoline. The device will use kerosene equally as well, but the latter is not to be preferred on account of its greater expense.

The company has made extensive tests of oil from California, Texas, Ohio, Pennsylvania, Colorado and Russia. While there is considerable difference in the crude oil from various sections it has been found possible to use any of the above mentioned oils. The consumption of fuel in the oil engine has been found to be about 1 gallon per actual horse-power per hour. The cost of operating therefore will seldom be over 5 cents per horse-power per hour and in some localities considerably less.

The directors of the Tennessee Coal, Iron & Railroad Company have not finally determined in which manner the proposed cast iron pipe foundry will be organized. Possibly a new company may be formed in a manner similar to that created when the steel plant at Ensley was built. The Tennessee Company of course would own the control of the stock of the new corporation in such a case.

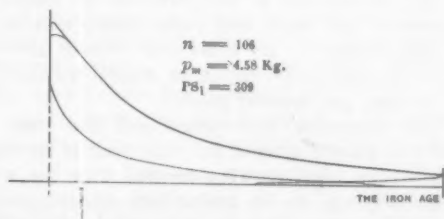


Fig. 29.—No Load Diagram.—Only One Cylinder Side in Operation.

gines by the ordering of four Oechelhaeuser engines of 600 horse-power each, especially constructed for use with a gas of low heating value. At Seraing in 1898 two 180 horse-power Cockerill gas engines using blast furnace gas were put in operation, while the first of the above mentioned 600 horse-power engines was started in May, 1898, and the second in the beginning of 1900.

The development of the two-cycle engines in really large units was the first step toward mechanical perfection. They did not show any improvements either from a thermo-dynamic or economic point of view, but their development is closely connected with the first utilization of blast furnace gas in large engines. As the four-cycle engines at the same time did not show any special progress mechanically, the belief became current that

Specifications for Cast Iron Car Wheels.

At the Atlantic City meeting of the American Society for Testing Materials the subcommittee on cast iron of Committee A, on Standard Specifications for Iron and Steel, submitted the following proposed standard specifications for cast iron wheels, which were approved by the meeting and will be submitted to a letter ballot of the members of the society:

The wheels furnished under this specification must be made from the best materials and in accordance with the best foundry methods. The following pattern analysis is given for information as representing the chemistry of a good cast iron wheel. Successful wheels varying in some of the constituents quite considerably from the figures given may be made:

	Per cent.
Total carbon.....	3.50
Graphitic carbon.....	2.90
Combined carbon.....	0.60
Silicon.....	0.70
Manganese.....	0.40
Phosphorus.....	0.50
Sulphur.....	0.05

1. Wheels will be inspected and tested at the place of manufacture.

2. All wheels must conform in general design and in measurements to drawings, which will be furnished, and any departure from the standard drawing must be by special permission in writing, and manufacturers wishing to deviate from the standard dimensions must submit duplicate drawings showing the proposed changes, which must be approved.

3. The following table gives data as to weight and tests of various kinds of wheels for different kinds of cars and service:

Wheel.....	33-inch diameter freight and passenger cars.		36-inch diameter.		
	60,000 lbs. capacity and less.	70,000 lbs. capacity.	100,000 lbs. capacity.	Pas-senger cars.	Loco-tive tenders
Kind of service..					
Number.....	1	2	3	4	5
Weight { Desired... 600		650	700	700 lbs.	750 lbs.
{ Variation..		Two per cent. either way.			
Height of drop, feet. 9	12	12	12	12	12
Number of blows... 10	10	12	12	12	14

4. Each wheel must have plainly cast on the outside plate the name of the maker and place of manufacture. Each wheel must also have cast on the inside double plate the date of casting and a serial foundry number. The manufacturer must also provide for the guarantee mark, if so required by the contract. No wheel bearing a duplicate number or a number which has once been passed upon will be considered. Numbers of wheels once rejected will remain unfilled. No wheel bearing an indistinct number or date or any evidence of an altered or defaced number will be considered.

5. All wheels offered for inspection must have been measured with a standard tape measure and must have the shrinkage number stenciled in plain figures on the inside of the wheel. The standard tape measure must correspond in form and construction to the "wheel circumference measure" established by the Master Car Builders' Association in 1900. The nomenclature of that measure need not, however, be followed, it being sufficient if the graduating marks indicating tape sizes are $\frac{1}{8}$ inch apart. Any convenient method of showing the shrinkage or stencil number may be employed. Experience shows that standard tape measures elongate a little with use, and it is essential to have them frequently compared and rectified. When ready for inspection the wheels must be arranged in rows according to shrinkage numbers, all wheels of the same date being grouped together. Wheels bearing dates more than 30 days prior to the date of inspection will not be accepted for test, except by permission. For any single inspection and test only wheels having three consecutive shrinkage or stencil numbers will be considered. The manufacturer will, of course, decide what three shrinkage or stencil numbers he will submit in any given lot of 103 wheels offered, and the same three shrinkage or stencil numbers need not be offered each time.

6. The body of the wheels must be smooth and free from slag and blowholes and the hubs must be solid.

Wheels will not be rejected because of drawing around the center core. The tread and throat of the wheels must be smooth, free from deep and irregular wrinkles, slag, sand wash, chill cracks or swollen rims, and be free from any evidence of hollow rims, and the throat and tread must be practically free from sweat.

Restrictions as to Chill.

7. Wheels tested must show soft, clean gray iron, free from defects, such as holes containing slag or dirt more than $\frac{1}{4}$ inch in diameter, or clusters of such holes, honey-combing of iron in the hub, white iron in the plates or hub, or clear white iron around the anchors of chaplets at a greater distance than $\frac{1}{2}$ inch in any direction. The depth of the clear white iron must not exceed $\frac{3}{8}$ inch at the throat and 1 inch at the middle of the tread, nor must it be less than $\frac{3}{8}$ inch at the throat or any part of the tread. The blending of the white iron with the gray iron behind must be without any distinct line of demarcation, and the iron must not have a mottled appearance in any part of the wheel at a greater distance than $1\frac{1}{2}$ inches from the tread or throat. The depth of chill will be determined by inspection of the three test wheels described below, all test wheels being broken for this purpose if necessary. If one only of the three test wheels fails in limits of chill all the lot under test of the same shrinkage or stencil number will be rejected and the test will be regarded as finished so far as this lot of 103 wheels is concerned. The manufacturer may, however, offer the wheels of the other two shrinkage or stencil numbers, provided they are acceptable in other respects, as constituents of another 103 wheels for a subsequent test. If two of the three test wheels fail in limits of chill the wheels in the lot of 103 of the same shrinkage or stencil number as these two wheels will be rejected, and, as before, the test will be regarded as finished so far as this lot of 103 wheels is concerned. The manufacturer may, however, offer the wheels of the third shrinkage or stencil number, provided they are acceptable in other respects, as constituents of another 103 wheels for a subsequent test. If all three test wheels fail in limits of chill, of course the whole hundred will be rejected.

8. The manufacturer must notify when he is ready to ship not less than 100 wheels, must wait the arrival of the inspector, must have a car or cars ready to be loaded with the wheels and must furnish facilities and labor to enable the inspector to inspect, test, load and ship the wheels promptly. Wheels offered for inspection must not be covered with any substance which will hide defects.

9. A hundred or more wheels being ready for test the inspector will make a list of the wheel numbers, at the same time examining each wheel for defects. Any wheels which fail to conform to specifications by reason of defects must be laid aside and such wheels will not be accepted for shipment. As individual wheels are rejected others of the proper shrinkage or stencil number may be offered to keep the number good.

10. The inspector will retape not less than 10 per cent. of the wheels offered for test, and if he finds any showing wrong tape marking he will tape the whole lot and require them to be restenciled, at the same time having the old stencil marks obliterated. He will weigh and make check measurements of at least 10 per cent. of the wheels offered for test, and if any of these wheels fail to conform to the specification he will weigh and measure the whole lot, refusing to accept for shipment any wheels which fail in these respects.

Drop Test and Thermal Test.

11. Experience indicates that wheels with higher shrinkage or lower stencil numbers are more apt to fail on thermal test, more apt to fail on drop test and more apt to exceed the maximum allowable chill than those with higher stencil or lower shrinkage numbers; while, on the other hand, wheels with higher stencil or lower shrinkage numbers are more apt to be deficient in chill. For each 103 wheels apparently acceptable the inspector will select three wheels for test—one from each of the three shrinkage or stencil numbers offered. One of these wheels chosen for this purpose by the inspector must be tested by drop test as follows: The wheel must be

placed flange downward in an anvil block weighing not less than 1700 pounds, set on rubble masonry 2 feet deep and having three supports not more than 5 inches wide for the flange of the wheel to rest on. It must be struck centrally upon the hub by a weight of 200 pounds, falling from a height as shown in the table, section 3. The end of the falling weight must be flat, so as to strike fairly on the hub, and when by wear the bottom of the weight assumes a round or conical form it must be replaced. The machine for making this test is shown on drawings, which will be furnished. Should the wheel stand without breaking in two or more pieces the number of blows shown in the above table the 100 wheels represented by it will be considered satisfactory as to this test. Should it fail the whole 100 will be rejected.

12. The other two test wheels must be tested as follows: The wheels must be laid flange down in the sand, and a channelway $1\frac{1}{2}$ inches in width at the center of the tread and 4 inches deep must be molded with green sand around the wheel. The clean tread of the wheel must form one side of this channelway, and the clean flange must form as much of the bottom as its width will cover. The channelway must then be filled to the top from one ladle with molten cast iron, which must be poured directly into the channelway without previous cooling or stirring, and this iron must be so hot when poured that the ring which is formed when the metal is cold shall be solid or free from wrinkles or layers. Iron at this temperature will usually cut a hole at the point of impact with the flange. In order to avoid spitting during the pouring, the tread and inside of the flange during the thermal test should be covered with a coat of shellac. Wheels which are wet or which have been exposed to snow or frost may be warmed sufficiently to dry them or remove the frost before testing, but under no circumstances must the thermal test be applied to a wheel that in any part feels warm to the hand. The time when pouring ceases must be noted, and two minutes later an examination of the wheel under test must be made. If the wheel is found broken in pieces or if any crack in the plates extends through or into the tread the test wheel will be regarded as having failed. If both wheels stand the whole 100 will be accepted as to this test. If both fail the whole 100 will be rejected. If only one of the thermal test wheels fails all of the lot under test of the same shrinkage or stencil number will be rejected and the test will be regarded as finished so far as this lot of wheels is concerned. The manufacturer may, however, offer the wheels of the other two shrinkage or stencil numbers, provided they are acceptable in other respects, as constituents of another 103 wheels for a subsequent test.

13. All wheels which pass inspection and test will be regarded as accepted, and may be either shipped or stored for future shipment, as arranged. It is desired that shipments should be as far as possible in lots of 100 wheels. In all cases the inspector must witness the shipment and he must give in his report the numbers of all wheels inspected and the disposition made of them.

Wheels That Fail.

14. Individual wheels will be considered to have failed and will not be accepted or further considered, which

(1) Do not conform to standard design and measurement;

(2) Are under or over weight;

(3) Have the physical defects described in section 6.

15. Each 103 wheels submitted for test will be considered to have failed and will not be accepted or considered further, if

(1) The test wheels do not conform to section 7, especially as to limits of white iron in the throat and tread and around chaplets;

(2) One of the test wheels does not stand the drop test as described in section 11;

(3) Both of the two test wheels do not stand the thermal test as described in section 12.

A Little Rock, Ark., dispatch says that the Arkansas Antitrust law was declared valid by the Supreme Court of the State on July 15. Two Justices dissented from the opinion. It is stated that the effect of the decision will

be to shut out from Arkansas all old line insurance companies that maintain a rating agreement. The law also prohibits the sale within the State of trust products.

PERSONAL.

Isham Randolph, chief engineer of the sanitary district of Chicago, has been given a leave of absence to attend the meeting of the Board of Consulting Engineers of the Panama Canal, of which body he is a member. The board meets in Washington September 1.

Robert D. Kuhn, special agent for the Crucible Steel Company of America, has been appointed manager of its Cleveland branch and district. Mr. Kuhn was for many years manager in the Cleveland district for the Park Steel Company.

R. E. Spencer Geare has been appointed Eastern sales manager for the Dayton Hydraulic Machinery Company, Dayton, Ohio, builder of the Brooks centrifugal pump, and has opened a New York office at 133 Liberty street.

Arthur Simonson, superintendent of the foundries of Wm. Wharton, Jr., & Co., Philadelphia, sails for Europe next month.

W. H. Nichols, who has been connected with the Hill Clutch Company of Cleveland, Ohio, for several years, has resigned to enter the sales department of the Berkshire Mfg. Company of Cleveland, manufacturer of molding machines.

John W. Daugherty, superintendent of the Steelton works of the Pennsylvania Steel Company, has sailed for Europe for a two months' trip. He will visit works in England and Germany.

Hans Renold of Manchester, England, who has introduced considerable American machinery in the works there with which he is connected, is visiting in the United States.

O. P. Letchworth of the Pratt & Letchworth Company, Buffalo, has returned from a European trip.

William Patterson, president of the National Bank of Lawrence County, New Castle, Pa., and one of the principal stockholders of the New Castle Forge & Bolt Company, Pennsylvania Engineering Works, New Castle Stamping Company and other important enterprises of the Shenango Valley, is seriously ill. He assisted largely in establishing several of the works in New Castle now owned by the United States Steel Corporation.

H. Stuart Hotchkiss has resigned as president and treasurer of the National Steel Foundry Company, New Haven, Conn., to give his undivided time to the L. Candee Company, of which he is vice-president and secretary.

Juan P. Toermann has been admitted to partnership in the firm of Heymann Sucesores, S. E. C., of Mazatlan, Sinawa, Mexico.

Among the newly elected directors of the Equitable Life Assurance Society are Frank S. Witherbee of Witherbee, Sherman & Co., Port Henry, N. Y., and Charles H. Zehnder of Rogers, Brown & Co., Philadelphia, and president of the Allegheny Ore & Iron Company of Virginia.

Col. H. M. Pellatt of Toronto, Ont., has been elected a director of the Dominion Iron & Steel Company of Sydney, C. B. Col. Pellatt is president of the Electrical Development Company of Ontario, Limited, which is constructing a tunnel and wheel pit on the Canadian side at Niagara for the development of electric power.

W. W. Gibbs, vice-president and general manager of the Iroquois Machine Company, New York, sails this week for Europe and will remain abroad about six weeks.

Clayton Mark, president of the Mark Mfg. Company, Chicago, has resigned from the presidency of the Chicago Board of Education to devote his time wholly to his large business interests. During his long service as president of this board, the city schools have been largely divorced from politics, and the business of the board conducted on business principles. Mr. Mark is also a director of the National Malleable Castings Company and general manager of the Chicago Malleable Iron Works branch.

THE IRON AGE

1855—1905.

New York, Thursday, July 20, 1905.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	-	PUBLISHER
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A Steady Consumption of Rolled Iron.

For the first time since 1890 the report of the American Iron and Steel Association, for 1904, separates the production of rolled iron from that of rolled steel. In the interval so much has been said about the passing of the puddler and the supplanting of iron by steel that the inference might fairly be made that rolled iron products had dwindled almost to the point of disappearance. While there has been actual displacement of iron by steel, as is quite well known, the statistics indicate that the important development in the fourteen years has been the turning of all the vastly increased consumption of the country to steel. So much has been written on this subject from time to time that the present purpose is merely to call attention to the change that has taken place in the relative positions of iron and steel as shown in the official statistics:

Production of Rolled Iron and Steel in the United States.—
Gross Tons.

	Rolled iron.	Rolled steel.	Total.
1885.....	1,611,184	No statistics.	
1886.....	2,038,948	2,293,680*	4,332,628
1887.....	2,311,161	2,924,545*	5,235,706
1888.....	2,153,262	2,464,087	4,617,349
1889.....	2,309,272	2,927,656	5,236,928
1890.....	2,518,194	3,504,681	6,022,875
No separated statistics 1891-1903, inclusive.			
1904.....	1,760,084	10,253,297	12,013,381

* Crucible steel not included.

A partial separation of the classes of product is made in the statistics of the American Iron and Steel Association, so that some of the shrinkage of iron production can be traced by referring to the statement below. It will be seen that the heaviest falling off in separately stated products is in plates and sheets. When it is considered that the tin plate industry has been built up since 1890, and that the production of steel plates and steel sheets in the United States last year amounted to about 2,350,000 gross tons, it can be appreciated that iron plates and sheets, with a total of 67,713 tons for 1904, constitute a very small portion of the country's total in these three lines:

Production of Rolled Iron in the United States in 1890 and 1904.
—Gross Tons.

	1904.	1890.
Plates and sheets.....	67,713	451,466
Wire rods.....	1,166	17,677
Rails.....	871	13,822
Structural shapes.....	8,019	Not sep.
Nail plate.....	19,419	*80,631
Merchant bar, skelp and bolt iron and all other.....	1,662,806	1,954,598
Totals.....	1,760,084	2,518,194

- Cut nails.

The prominent fact in the statistics is that the production of merchant bar iron and wrought iron pipe, which are the principal factors in the last item of the table, have held their volume with comparative steadiness, when changes in other directions are considered. There have probably been larger outputs of finished iron since 1890 than that of last year. No doubt the total of 1903 was greater than that of 1904, and it is known that in 1899 and again in 1902 every puddling furnace in the country was operated for a time, iron mills having to

come to the rescue in the inadequacy of steel plants to supply the demand upon them. In this connection it is interesting to note how the production of leading articles of finished rolled steel in 1904 compared with the production in the same year of like articles of finished rolled iron. All miscellaneous products are included:

*Production of Leading Articles of Rolled Iron and Rolled Steel
in the United States in 1904.—Gross Tons.*

	Steel.	Iron.	Total.
Rails	2,283,840	871	2,284,711
Structural shapes.....	941,127	8,019	949,146
Plates and sheets.....	2,353,685	67,713	2,421,398
Nail plate.....	42,182	19,419	61,601
Wire rods.....	1,697,862	1,166	1,699,028
Merchant bars, skeip, spike rods, splice bars and other finished rolled products	2,934,601	1,662,896	4,597,497
Totals	10,253,297	1,760,084	12,013,381

The fact seems to be that a certain quota of iron is steadily called for, though the figures give no evidence of the pronounced preference for iron in some lines because of the alleged unsatisfactory service of steel, about which we hear now and again.

Machinery Commission Annoyances.

Manufacturers of machine tools experience a good deal of annoyance in deciding who is entitled to commissions on sales. The amount of annoyance depends largely upon the rigidity with which the manufacturer lives up to his agreements with his authorized representatives among the machinery dealers. It frequently happens that some one, either a salesman or a local machinery dealer, gets an order for tools within territory belonging to an accredited agent and sends it direct to the manufacturer. The usual agreement, definitely stated or implied, is that in such cases the sender of the order should be referred to the agent, who may make any bargain he may see fit for a division of the commission, the general rule being share and share alike. But such instances are oftentimes complicated and the manufacturer is made a party to the dispute between his representative and the house or individual making the sale. If the rule is rigidly observed and the manufacturer declines absolutely to interfere, persisting in referring the whole question to his agent, he soon gets the reputation for standing by his agents, which generally works to his material advantage in the long run, though he may lack in popularity among the dealers of the smaller cities included in large districts, the headquarters of which are the great centers of trade, as New York, Boston and Chicago.

If the manufacturer, on the other hand, takes the side of the smaller dealer, perhaps because he thinks that his agent is in the wrong in the division of a commission, then he has his troubles. He must sit in judgment on each individual case where a dispute arises, and such contentions are by no means rare. He may be right in a sense, but he will suffer. If he has an agreement with an agent for a considerable territory, New York State or New England, for instance, that such agent shall have his territory to the exclusion of all others, then it does not follow because another dealer gets business that would not otherwise have been obtained that he should have the commission to the exclusion of the regular agent. It is pretty well established that the proper course to pursue is always to refer all other dealers and salesmen to the agent. It sometimes happens that after a machinery house has worked up an order for a certain tool for which it has the agency almost to the selling point a local dealer steps in and takes it through personal acquaintance or through the sentiment which leads men to patronize home dealers whenever possible. This

dealer sends the order to the manufacturer, who refers him to the agent for the territory in question. The agent may consider that to him belongs the credit of the business because it was he or his salesmen who worked up the customer to the point of buying the particular make of tool in question. He may not feel like dividing the commission on an equal basis. He may do it from policy's sake, or he may refuse to divide it, which means that the order must be filled from the manufacturer direct or perhaps not filled at all. In such an extreme case the machine tool builder might very well fill the order and adjust the commission in what he considers an equitable way. But he should see to it that his agent is well treated.

At the present time complications are arising out of a large amount of business that has long been pending. It is no infrequent matter to book an order on which the first inquiries date back more than two years. The recent depression caused a postponement of many orders which are now being placed. During this time agencies have changed and the manufacturer may have to look to it that his agent at the time of working up the business shall be taken care of, even if there has been a change in agents. Usually such instances are noted when the agreement with the new agent is made, and when the order is fairly put through the matter is carefully attended to.

The reputation of being square with the agent is worth much to the manufacturer. The machinery dealers naturally favor those houses which can always be depended upon to back them up in the matter of commissions. Occasionally a manufacturer's idea of square dealing differs from that of his agent, and this does not matter much in their relations, provided the whole thing is based upon fair play. The manufacturer who surreptitiously sells direct to a customer in territory which he has given exclusively to his agent under contract is a sufferer in the long run. Usually such a thing is impossible, excepting of course if the contract provides for that manner of doing business, or where the agent is given his commission regardless of whether he has anything to do with getting the order or not. The golden rule of commission house business is to be square.

The Importance of the Crop Reports.

The manufacturer seems to have been left out of consideration in the discussion of the proposition that the Government crop reports be abolished. The statement has been made that none but the speculator benefits by these bulletins of agricultural conditions and prospects. This is very far from the fact. The manufacturer reads them with great interest. They are often vital to his plans. The same is true of the jobber. It makes a vast difference in many manufacturing and mercantile lines whether the crops are good or poor. If they promise well the storekeepers of agricultural districts order large stocks of goods. If the signs are ominous then small stocks are the rule. If the farmer is buying the whole country feels it.

The manufacturer must look ahead. He does not wish to produce a surplus stock, neither does he wish to be caught unprepared for the demand. And the demand for many articles, for the materials from which they are made and for the tools that make them depends a good deal upon the crops. Take away the Government reports and the country would be dependent upon the bulletins issued by the brokers and others who may or may not be honest in the motives prompting them in the

dissemination of information. We believe that no one has impugned the Government's purpose in procuring the best possible information and publishing it. A few dishonest Government employees should not be taken as an excuse for abolishing a very important Government work in the public interest.

Misapplied Genius.

Humor and pathos are generally mingled in the story of the so-called revolutionizing inventions. These usually originate in the smaller industrial centers, each being the product of some genius with a limited appreciation of the conditions affecting his problem. After confiding in the local *Oracle* and reading its forecast of the wonderful results to follow the adoption of his invention there is no longer doubt in the mind of the inventor that he is an epoch maker in industry. The pity is that people given to happy ideas are loth to take counsel of those qualified to judge of the value of such ideas.

Fortunately many of the wonders exploited in newspaper columns are so impracticable or impossible that few are deceived, but frequently a man with more dollars than sense becomes involved and gets an experience that leaves the account more nearly balanced. On the other hand, there are inventions of a more dangerous character because in explaining their value the inventors have apparently followed a sound line of reasoning.

One such has recently come to our attention. This is a new slide valve in which the periods of admission and exhaust are made independent of one another, so that changing the point of cut off does not alter the point at which compression begins. The idea has been cleverly worked out, and if there were a real need of it the invention might be called a success. The argument made in the application for patent is convincing until the fallacy at the bottom of it is recognized. The inventor says:

In the engines now in general use upon railroads the mechanism by which the steam is admitted to the cylinder and allowed to escape therefrom is such that when the stroke of the inlet valve is reduced to lessen the amount of steam admitted to the cylinder there is a corresponding reduction of the exhaust. The reduction of the exhaust when the inlet of steam into the cylinder is reduced is exceedingly undesirable for the reason that the steam in front of the piston during its stroke opposes a considerable resistance to the movement of the piston under the influence of the steam behind it, and it is exceedingly desirable to reduce this resistance opposed to the piston by the unexhausted steam to an amount which is just sufficient to serve as a cushion between the piston and the cylinder head.

If means were provided for effecting the complete exhaust of the steam in front of the piston so as to allow the full effect of the steam behind the piston to be obtained an increase of approximately 50 per cent. of the efficiency in the engine would result. It is, however, impossible with an engine having a reciprocating piston to dispense with all resistance from unexhausted steam in the cylinder, as it is necessary to provide a cushion between the piston and the cylinder head to avoid injury to the cylinder head from the violent and unopposed stroke of the piston, but the necessary cushion is afforded by a much smaller quantity of steam than now remains in the cylinder during the stroke.

A little consideration shows that the inventor has lost sight of the fact that in compressing the steam in the engine cylinder energy is not wasted, as the work done is recovered on the next forward stroke and at the same time the amount of steam required is reduced. Any one with a slight acquaintance with thermodynamics knows that in the theoretically perfect engine card of the Carnot cycle the compression is carried up to the point of admission. The work obtained and represented by the area inclosed by the card is the greatest obtainable for the amount of steam consumed. With this new invention the form of the card would be changed and, to be sure, would have a slightly greater area, but no atten-

tion has been paid to the cost of the extra work done in terms of steam expended. There can be no doubt that the volume of steam used per stroke would be increased in greater proportion than the work gained, which quite puts in question the inventor's claim of fifty per cent. greater efficiency.

The reason given for the necessity of a steam cushion is also in error. It is not to prevent injury to the cylinder head, but gradually to arrest the movement of the reciprocating parts. With sufficient clearance and a freely open exhaust there would be even less danger of knocking out a cylinder head than when pressure is transmitted to it during compression through the medium of the steam.

The inventor has been working over well trodden ground and might have saved himself the disappointment of failure had he given more study to the work of his predecessors. Unfortunately, he has struck upon a deceptive problem. It is another case in which "a little knowledge is a dangerous thing," for with a better understanding of his subject he would have realized that the gain which at first glance he was led to believe would follow entails a greater loss in another direction.

The Ontario Power Company's Hydro-Electric Plant.

NIAGARA FALLS, July 14, 1905.—The first two 10,000 horse-power units in the station of the Ontario Power Company, on the Canadian side at Niagara Falls, are ready for operation. Under its agreement with the Commissioners of Victoria Park the Ontario Power Company was to have power ready for commercial service July 1, and on that day the first unit was started successfully. The starting of the machines was witnessed by officials of the company, and thus the second of the three power companies to do business on the Canadian side is now in the field to sell its product.

Steel Flumes Used Instead of Tunnels.

Unlike the two other power companies that have franchises in Victoria Park, the Ontario Power Company did not select the tunnel method of development, but built two large forebays adjacent to the upper rapids, and from the inner one of these forebays a great steel flume 18 feet in diameter carries the water over 6000 feet through the park to a point about old Table Rock, where the penstocks that carry the water to the turbines are fed. The power house of the Ontario Power Company is located at the water's edge in the gorge. It stands very close up to the foot of the Canadian end of the Horseshoe Fall and is in full view of every sightseer. Only one section of the building has so far been completed, but it is proposed to develop no less than 60,000 electrical horse-power in this section, the completed building to have an installation that will develop 180,000 horse-power, the water for the operation of the turbines to be supplied by three great steel flumes similar to the one already laid or built.

In some respects the method employed by the Ontario Power Company in the development of power resembles that of the Niagara Falls Hydraulic Power & Mfg. Company, whose plant is on the New York side lower down the gorge, where it does not trespass upon the view of the waterfall. However, instead of a flume the latter company employs a surface canal to carry water from the upper river to the edge of the high bank, and its huge penstocks stand out in column form from the cliff, while the penstocks of the Ontario Power Company are concealed in shafts and tunnels that have been sunk and driven through the rocky bank in order that the construction might not mar the falls view or impair the natural beauty of the locality.

Each turbine in the station of the Ontario Power Company stands 13 feet above the floor, the bed plates measuring 21 x 29 feet. They are of the inward flow double Francis discharge type, with two runners 78

inches in diameter, each capable of developing 5700 horse-power. Swivel gates, which also act as guides, control the water at the turbine. Lombard governors are used. When operated under a head of 175 feet the wheels make 187½ revolutions per minute, the 175 feet head being made up of 155 feet above the center of the shaft and 20 feet below it. The turbines were designed and made by J. M. Voith, Heidenheim, Germany. It is stated that the thrust of the water column equals 650,000 pounds for each turbine. Turbine and generator No. 3 are now being installed.

Each of the 18-foot flumes will supply eight penstocks, six of which will each have a diameter of 9 feet, and two of 30 inches, the latter to supply the wheels of the excitors. At the end of each penstock relief valves are provided, discharging directly into the tail race. It has been observed that the level of the lower Niagara varies greatly at seasons, it being stated that a depth of 1 foot above the fall means an increased depth of 17 feet below, and for this reason the tail race is separated from the river by a weir, the crest of which is 7 feet above the normal level of the stream. The tail race and draft tube below the power house floor are of concrete, the draft tube having a length of about 50 feet and is about 10 feet in diameter. Before delivering water to the wheels the 9-foot penstocks divide into two sections or branches, one for each wheel. Each wheel has a diameter of 6.5 feet at the tips of the runners, and the pair of wheels on each shaft is mounted a little over 18 feet apart, the draft tube being between the cases.

In the construction of the flumes steel plates ½-inch thick were used, and these are jointed with double rows of 1-inch rivets. At intervals of 4 feet the plates are reinforced by 8-inch steel deck beams bent to the radius of the pipe and riveted to the upper half. Each tube or flume will divert about 3900 cubic feet of water per second, and the water will flow through the flume at about 15 feet per second. The flume already built lies in a trench excavated through the park and covered with earth in order that the scenic view may not be marred. Before being covered the steel flume was painted to prevent rust, while conducting terminals are attached every few feet to capture and carry off stray electric currents to prevent the destruction of the pipe by electrolysis.

Electric current generated in the power house is carried on cables to a distributing station located on the bluff back of Victoria Park and above the power house at least 255 feet, while it is 550 feet back of it. The agreement with the Park Commissioners requires that all power shall be transmitted outside the park for commercial application, it not being intended that any industries shall locate on the park lands.

Will Supply Power to Empire State Cities.

The Ontario Power Company has contracted with the Niagara, Lockport & Ontario Power Company to deliver quite a large block of power at the international boundary line near the Devil's Hole, a point 3 miles or more down the river from the power house. The Niagara, Lockport & Ontario Power Company will transmit this power to Rochester and other places east of Niagara, it being intimated that efforts will be made to reach Syracuse and Albany, while Lockport is also an objective point. The power will be carried by cables strung across the river and suspended from towers to be erected on each side of the stream. The power designed for this transmission will pass from the generators in the power station to the distributing station on top of the bluff and high bank over the power house, where its voltage will be raised and it will be sent to a transformer station now in course of erection on the American side of the river below the Devil's Hole, and from this station the current will be sent eastward into the interior of the State. Work at all points is progressing rapidly.

For carrying steel and other heavy materials a car with a capacity of 150,000 pounds has been constructed at the McKees Rocks shops of the Pittsburgh & Lake Erie Railroad. The car is itself of steel and has eight steel tired 26-inch wheels.

NEWS OF THE WORKS.

Iron and Steel.

Preparations are being made to blow in the West End Furnace at Roanoke, Va.

The Iron City Steel Company, Pittsburgh, has been granted a charter by the State of Pennsylvania to engage in the buying and selling of all kinds of iron and steel. The capital is \$10,000, and William Leigh is treasurer.

The Thomas Iron Company has blown in one of its Hoken-dauqua furnaces.

The second blast furnace of the Buffalo & Susquehanna Iron Company, Buffalo, N. Y., has been blown in.

The Lukens Iron & Steel Company, Coatesville, Pa., is erecting an addition to the shipping house in its 140-inch mill, in which will be installed a traveling crane which has been purchased. The company is also erecting a new flanging shop and is having some special machinery built for it, including an extra large flanging machine to operate by the spinning process and a specially designed hydraulic flanger to do all sorts of irregular work, such as marine boiler flanging, &c. There will be some other machinery installed, but the company is not in the market at the present time.

On Monday, July 17, the Republic Iron & Steel Company placed its new rail mill at Youngstown, Ohio, in operation.

General Machinery.

The contract for electric cranes received by the Youngstown Engineering Company, Youngstown, Ohio, for the National works of the National Tube Company, McKeesport, Pa., mentioned in these columns last week, includes seven cranes, one of 20 tons capacity, 68 foot span; three of 10 tons capacity, 65 foot span, and one of 10 tons capacity, 85 foot span, all of its standard type; also two 10-ton cranes, 85 foot span, of special design for handling pipe.

The American Optical Company, Southbridge, Mass., is making a small addition to its machine shop. The company states that no new tools are required.

The Vulcan Iron Works Company, Toledo, Ohio, has just shipped to Rochesses & Collins of Victoria a large steam shovel for use by the Northern Mine Company, Altin, B. C. Last week it shipped several large shovels to Kimberley, South Africa, for diamond mining work.

At a meeting of the creditors of the National Electric Company, Milwaukee, held Friday, July 14, John I. Beggs, general manager of the Milwaukee Electric Railway & Light Company, was unanimously elected trustee. Mr. Beggs was named as receiver of the company two months ago and has been conducting the business in that capacity.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., is in the market for a small electric traveling crane, from 2 to 5 tons capacity, 30 to 40 feet span and 15 or 20 feet hoist, with direct current motors of 220 volts.

The Western Wheeled Scraper Company, Aurora, Ill., has completed a large addition to its plant, in which it has installed a 15-ton three-motor electric traveling crane made by the Northern Engineering Works, Detroit, Mich.

At the recent annual meeting of the Crocker-Wheeler Company, Ampere, N. J., the following officers were re-elected: Schuyler Skaats Wheeler, president; Gano S. Dunn, vice-president and chief engineer; W. L. Brownell, treasurer; G. W. Bower, assistant treasurer. The directors are: Prof. Francis B. Crocker of Columbia University, Dr. Wheeler, Messrs. Dunn and Doremus, A. Foster Higgins, Herbert Noble, Thomas Ewing, Jr., F. L. Eldridge and C. A. Spofford.

T. L. La Malta has been appointed receiver for the J. G. Duke Machine Works, Memphis, Tenn.

A feature of the boiler plant of the Garlock-Frazee Laundry Company, Cleveland, Ohio, is the induced mechanical draft apparatus applied to four Babcock & Wilcox boilers, aggregating about 1000 rated horse-power. This apparatus, furnished by the B. F. Sturtevant Company, Boston, Mass., consists of an 8-foot blast wheel driven by a direct connected 7 x 10½ inch horizontal engine, the steam pressure being maintained practically constant by means of a Foster regulating valve. The boilers are equipped with chain grates and the apparatus is designed to have draft sufficient to burn the general run of Pittsburgh slack. Other recent orders include hot blast drying apparatus for drying hops in the Sacramento Valley, lumber in Iowa, cloth in North Carolina, brick in Georgia, gunpowder in New Jersey, lace curtains and handkerchiefs in Illinois, fish fertilizer in New York, rubber in Massachusetts, artificial leather in New Jersey and plaster in New York; complete forge shop equipment of the new manual training school of Washington University, St. Louis, Mo., consisting of 20 down draft forges with blast and exhaust fans; dry kilns for the Moline Furniture Works, Moline, Ill.; Eagle Wagon Company, Auburn, N. Y., and the Votey Organ Company, Harwood, N. J.; marine generating sets for F. B. Pulson's and Timothy Eaton's private yachts, building at Toronto, Ont.; for the tug Menasket, and through the Portsmouth Navy Yard for shops of the United States navy; complete heating and ventilating systems for the Fall River

Iron Works Company, Fall River, Mass.; Nashua Mfg. Company, Nashua, N. H.; Bemis Bros. Bag Company, Kansas City, Mo.; Fore River Shipbuilding Company, Fore River, Mass.; Lewis A. Crossett, North Abington, Mass.; Trenton Brass & Machine Company, Trenton, N. J., and the Arlington Mills, Lawrence, Mass.

Power Plant Equipment.

J. C. Gibson, chairman Fire, Water and Light Committee, Winnipeg, Man., will receive bids until August 7 for a gas engine pumping plant of 9000 gallons capacity.

The trustees of the Pennsylvania State Hospital, at Harrisburg, Pa., have awarded the contract for new boilers and appliances to the York Engine Company, York, Pa., and for the stack to the Kellogg Company, New York.

The controlling interest in the Beaver Mfg. Company, Milwaukee, Wis., has been secured by T. J. Neacy and Walter Read of the Filler & Stowell Mfg. Company. The company is capitalized at \$50,000 and manufactures gasoline motors. S. W. Watkins, formerly president of the National Electric Company, is secretary and treasurer of the company. The plant is located at 237 Oregon street.

Foundries.

The Cahill grate plant has been purchased by the Chattanooga Roofing & Foundry Company from the Cahill Iron Works, Chattanooga, Tenn. In addition to its large plant, which now covers several acres, the Chattanooga Roofing & Foundry Company has about completed a three-story building, 50 x 100 feet, which will be equipped with the latest improved machinery for the manufacture of the Cahill grates and a full line of fancy plated grates and mantel trimmings. Its new grate catalogue will soon be ready for distribution.

The Lebanon Stove Works, Lebanon, Pa., has started up its foundry after being idle for over a month. The plant will be run the rest of the summer.

The Davison-Namack Foundry Company, Ballston Spa, N. Y., is to erect an addition to its molding room and may be in the market for a blower and tumbling barrel. The company has recently secured several large orders from the General Electric Company and the Schenectady works of the American Locomotive Company.

The C. R. Harper Mfg. Company, Marshalltown, Iowa, is building a new foundry, which will be utilized for the manufacture of cast iron soil pipe and fittings and for a general foundry business.

The city of Saginaw, Mich., will receive bids until August 4 for cast iron pipe and special castings. Andrew J. Lynd is City Clerk.

Referee in Bankruptcy Wm. H. Hotchkiss, Buffalo, N. Y., last week appointed J. C. Bradley, John J. Lanahan and Jesse R. Benton appraisers of the Lancaster Malleable Iron Works, Lancaster, N. Y., now in bankruptcy, the appraisers to report July 22. The proposed purchase of the Lancaster Malleable Iron Works by the American Brake Shoe & Foundry Company, New York, is held in abeyance pending the outcome of the report in the bankruptcy proceedings.

Bridges and Buildings.

The Massillon Bridge Company, Massillon, Ohio, has the contract for the construction of a bridge at Ada, Mich. The structure will be erected at a cost of \$7544.

The Missouri Valley Bridge & Iron Company, Leavenworth, Kan., will erect the steel work for the new auditorium and exposition building at the Fair Grounds, Dallas, Texas. The buildings will cover 2 acres and the steel work will cost \$15,350.

Porter Brothers, Spokane, Wash., have been awarded contracts by the Spokane & Inland Railway Company, the Spokane Terminal Company and the Spokane and Coeur d'Alene Electric Road for the erection of seven bridges, aggregating in cost between \$300,000 and \$400,000.

Fires.

The plant of the Scranton Steam Pump Company, Scranton, Pa., was damaged to the extent of \$150,000, but will be rebuilt. The building destroyed was 150 x 350 feet and of wood.

Nelson Morris & Co.'s packing plant at Allegheny City, Pa., was burned July 11.

On July 10 a fire did \$100,000 damage to the plant of Ireland & Matthews Mfg. Company, Detroit, Mich., manufacturer of sheet iron work.

S. H. Seavel's machine shop, Abilene, Texas, was recently burned. The loss is about \$7000.

Hardware.

The Wilkinson Shear Works, Reading, Pa., has elected these officers: C. S. Prizer, president; P. A. Bushong, treasurer, and J. L. Bull and Dr. H. G. Dixon, Gettysburg; J. H. Cheetham, C. S. Prizer and Cyrus G. Derr, Reading, directors. A 5 per cent. dividend was declared.

The Capewell Horse Nail Company, Hartford, Conn., is establishing a factory at Toronto to supply the Canadian market.

The Chicago Hardware Foundry Company, North Chicago, Ill., is not only rebuilding the burned portion of its plant, but is putting up a number of new structures. These buildings include stock and shipping room, two stories, 80 x 104 feet, of brick and steel construction; flask building, 16 x 300 feet, with brick fire wall partitions every 25 feet; addition to office, which will make one building of the three structures now occupying the front of the plant. The company has purchased wood working machinery for its pattern and carpenter shop.

The Best Ammunition Company, Cromwell, Conn., has been incorporated to manufacture primers, cartridges and ammunition of all kinds. The capital stock is \$50,000, of which \$26,000 is paid in. The incorporators are Charles B. Frisbie, Lyman D. Mills and Charles A. Bailey.

Excelsior Hardware Company, Buffalo, N. Y., reports itself very busy on orders for Morrill's pattern No. 1 saw sets, malleable iron hack saw frames, Atkins' pattern Excelsior saw tools, iron handle glass cutters, cast sheet nail hammers, &c.

Miscellaneous.

The Middletown Car Works, Middletown, Pa., has received a contract to build a number of its cars of the King-Lawson type for the Panama Railroad. The company is now building a number of cars for the Imperial Japanese Railways.

The Thompson Gate & Mfg. Company has incorporated for \$75,000 and will operate a plant at East St. Louis, Ill., for the manufacture of gates. The incorporators are C. L. Gray, F. L. Hamlin and E. Christie.

The Reading Metal Body Company, Reading, Pa., has filed an application for a State charter to carry on the business of making automobile parts. James C. Reber, Harry C. Ulrich and C. S. Maderia are the incorporators. The company will start with a capital of \$25,000.

The Spring Bearing Truck Company has been organized at Milwaukee with a capital of \$10,000. Guido J. Hansen, Arthur P. H. Inbusch and Sam N. Olson, incorporators.

The Bickford Fire Brick Company, Lock Haven, Pa., has been chartered with a capital of \$5000. M. Bickford, Lock Haven, is treasurer.

The Salem Machine Knives Company, Salem, Mass., has incorporated its business under Massachusetts laws with a capital stock of \$5000. The officers are: President, J. Blouin, Salem; treasurer, P. St. Pierre, Danvers; clerk, J. J. Duquette, Salem.

The National Metal Furniture Company, Tell City, Ind., recently incorporated, has bought the buildings and power owned and occupied by the United States Hame Company. The Hame Company will remove to its new plant, covering about 4 acres.

A mortgage for \$1,500,000 has been given by the Walter A. Wood Mowing & Reaping Machine Company, Hoosick Falls, N. Y., to secure an issue of bonds. The bonds will be issued to refund about \$900,000 of mortgage bonds and 6 per cent. debentures, the unpaid remainder of an issue of December 1, 1893, and the remainder of an issue of \$300,000 of the company's 6 per cent. debentures under date of December 1, 1900. The balance of the \$550,000 of the new bonds will be issued from time to time for the purpose of making extensions to the plant and extending the company's business. The company recently commenced the manufacture of new earth working tools, the patent rights for which were purchased from the Buffalo-Pitts Company. It expects to manufacture about 10,000 of these tools this summer.

The shipbuilding plant of the William R. Trigg Company, Richmond, Va., has been sold by order of the court to Frank Samuel and H. G. Lloyd, both of Philadelphia, for \$368,000. It is understood that the plant was bought in for the bondholders.

The Stratford Railway Construction Company has been incorporated at Buffalo, N. Y., with a capital of \$50,000. Directors are L. B. Grout, W. J. Bagwell and C. T. Clark.

The Niagara River Mfg. Company, recently incorporated at Niagara Falls, N. Y., is about to let contracts for the construction of its plant and the equipment of same with machinery for the manufacture of wood pulp.

Geo. Lelfer is president, J. M. Baker, vice-president, and H. K. Ford, secretary, of a new company formed at Little Rock, Ark., to build and operate a plant for the manufacture of concrete building blocks, roof tiling and hard plaster. There is already one building, 100 x 120 feet, erected, and a second structure for the manufacture of hard plaster and roof tiling is to be erected without much delay. The plant will be fitted up with the latest machinery, all of which has been purchased.

The Toledo Plow Company, Toledo, Ohio, has been incorporated with \$25,000 capital stock by E. W. Tolerton, H. E. Frankeberger, R. W. Kirkley, C. W. Bond and Frank H. Gear. The company will go into the manufacture of plows in Toledo, but it has not decided on a location for its plant.

The Toledo Dust Guard Company, Toledo, Ohio, is having plans prepared for a new factory building. The structure will be 60 x 100 feet and three stories high. It will be equipped throughout with new machinery for the manufacture of patent dust guards for journal boxes on railroad cars, in which busi-

ness the company has been engaged for the past ten years. A site has not yet been selected.

At the new plant of the New Castle Portland Cement Company, near New Castle, Pa., much of the machinery has been placed in position and the plant will be started up some time this fall. The company will be a very large producer of limestone for blast furnace use in New Castle and of all kinds of brick as well as of Portland cement.

Labor Notes.

The molders at the plant of the American Car & Ship Hardware Company, New Castle, Pa., are out on a strike, caused by the discharge of one of their number.

The foundry helpers and laborers on strike from the foundry of the E. W. Bliss Company, Brooklyn, N. Y., applied for work on Wednesday, July 12. The Bliss Company employed a few of the strikers and retained in its employment the workmen hired during the strike. It made no concessions of any kind to the strikers and re-employed the men at the same wages paid before the strike. The return of the strikers to the Bliss Company ends an unsuccessful strike of the International Brotherhood of Foundry Employees against the New York and New Jersey Foundrymen's Association to enforce a "closed shop" agreement and an increase in wages. The Brotherhood during the last few weeks of the strike directed all its forces against the Bliss Company, and the company made a splendid fight to maintain its position.

The semiannual report of the Massachusetts State Bureau of Statistics of Labor gives a line on the labor situation as compared with last year. During the six months ending April 1 there were 65 strikes and lock-outs in the State, as compared with 95 for the corresponding six months of 1903-1904 and as compared with 100 of the previous six months of 1904. Most significant is the statement of the report that only four strikes affected metal lines and two of these were blacksmiths'. Building trades, the textile and the boot and shoe industries had the bulk of the trouble. In this connection it should be mentioned that most men of the metal trades are employed; in fact, employers are getting sensitive as to the hiring away of their men because it is exceedingly difficult to procure first-class workmen, or even workmen of average skill, and when employers resent this interference it is generally a pretty good sign of a strong demand for their products.

The coremakers employed in the foundries of Boston have made a demand for an increase in minimum wage from \$2.50 to \$2.75 a day. The shops are on a union basis, which complicates the demand, though the molders are not directly affected, having made no demand themselves. They refuse, however, to handle cores made by other than union coremakers. The demand puts the coremakers on an equal footing with the molders in the matter of minimum wage. The Gibby Foundry Company, which operates the Condor Iron Foundry, East Boston, and the Mechanics' Iron Foundry, Roxbury, have thus far declined to accede to the demands. Osgood & Wetherbee, Charlestown, manufacturers of sewage pipe and similar goods, have not granted the demand, stating that the loss of coremakers is of little importance in their work. The Hunt-Spiller Mfg. Company, South Boston; Smith & Co., West Everett; Whittier Machine Company, South Boston, and the Granular Metal Company, Roxbury, have agreed to the new scale.

J. J. Wright, general manager of the Toronto (Ont.) Electric Light Company, is quoted as follows: "It is extremely probable that in the very near future all the railways on the Niagara peninsula will be operated electrically, for the railway locomotive is the most uneconomical form of steam engine there is. There is absolutely no reason why all the trains within at least 40 or 50 miles of the falls of Niagara should not be operated by electricity. Eventually, no doubt, all the railways in Southwestern Ontario from Toronto westward will be run in that way."

The Iron and Metal Trades

The long delayed buying movement in Pig Iron has come rather unexpectedly, and while it has not developed in any large proportions yet it has greatly encouraged sellers. Some of the leading consuming interests, and notably the Cast Iron Pipe consolidation, started the buying. This interest took about 26,000 tons of Southern Iron at various prices at and below \$11, Birmingham. Other melters followed, and in the aggregate a considerable tonnage was placed in all the principal distributing markets.

In the East some round lots of Basic Pig were taken by Steel works, aggregating about 15,000 tons. Rolling mills placed orders in moderate individual amounts for a good deal of tonnage for the next quarter. In the Pittsburgh districts the mills also bought quite a quantity of Forge grades.

From Chicago comes the report of sales of Malleable Pig aggregating about 20,000 tons, of sales of Basic Pig to a local plant of 10,000 tons and of purchases by a St. Louis car builder of about 10,000 tons of Foundry Iron.

Orders from the general foundry trade have been in fair volume and have been well distributed. Much of the business was done at low price, at \$11 and under, Birmingham, but now \$11.25 for early delivery has become scarce and the leading makers ask \$11.50 and upward for delivery during the balance of the year.

So far as can be learned consumers have only partially covered requirements for the balance of the year. From Cleveland comes the report that a buying pool has been formed in that important foundry center among buyers of Pig Iron.

The business in the heavy lines—Steel Rails, Plates and Shapes—continues very satisfactory. There is little prospect of any advance in official prices, but it seems likely that premiums on Shapes may become more general. The largest contract placed during the week was that for 15,000 tons for the Poughkeepsie Bridge.

In the lighter lines there is a notable movement in the Steel Bar trade, and a better feeling prevails in sheets. In these branches, as in the Wire trade, the stocks in the hands of distributors have been pretty well worked off.

The leading Tin Plate interest has a large accumulation, collected in anticipation of a possible strike.

The export trade goes on in a very satisfactory manner. It is an interesting fact that in spite of the rush for material for home use during last winter and spring the export tonnage of the United States Steel Corporation during the first six months of this year was only 46,000 tons below the shipments of the corresponding period of last year, when export work was sought so vigorously and effectively. Last year the total shipments for six months ran a little above 500,000 tons. This year they are slightly below that figure.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

PIG IRON:	July19, 1905.	July12, 1905.	June21, 1905.	July20, 1904.
Foundry Pig No. 2, Standard, Philadelphia	\$16.25	\$16.00	\$16.50	\$14.25
Foundry Pig No. 2, Southern, Cincinnati	13.75	13.50	14.50	11.75
Foundry Pig No. 2, Local, Chicago	16.25	16.00	16.25	13.25
Bessemer Pig, Pittsburgh.....	14.85	14.85	15.35	12.50
Gray Forge, Pittsburgh.....	14.50	14.60	14.85	11.85
Lake Superior Charcoal, Chicago	16.50	16.50	16.50	14.50

BILLETS, RAILS, &c.:

Steel Billets, Pittsburgh.....	23.00	21.00	21.00	23.00
Steel Forging Billets, Pittsburgh.	25.00	24.00	25.00	....
Steel Billets, Philadelphia.....	26.00	26.00	26.00	24.00
Steel Billets, Chicago.....	28.00	27.00	28.00	22.00
Wire Rods, Pittsburgh.....	32.00	32.00	33.00	28.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL:

O. Steel Rails, Chicago.....	13.50	13.00	12.00	9.50
O. Steel Rails, Philadelphia....	16.00	15.00	15.00	11.00
O. Iron Rails, Chicago.....	17.75	17.50	17.00	14.00
O. Iron Rails, Philadelphia....	17.50	18.00	18.00	13.75
O. Car Wheels, Chicago.....	14.25	14.25	14.25	10.50
O. Car Wheels, Philadelphia....	14.00	14.00	14.50	10.50
Heavy Steel Scrap, Pittsburgh...	14.00	14.00	13.50	10.50
Heavy Steel Scrap, Chicago....	13.00	12.25	11.75	9.00

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia.	1.63½	1.63½	1.63½	1.48½
Common Iron Bars, Chicago....	1.50	1.45	1.50	1.30
Common Iron Bars, Pittsburgh..	1.55	1.55	1.55	1.30
Steel Bars, Tidewater.....	1.64½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh.....	1.50	1.50	1.40	1.35
Tank Plates, Tidewater.....	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh.....	1.60	1.60	1.60	1.60
Beams, Tidewater.....	1.74½	1.74½	1.74½	1.74½
Beams, Pittsburgh.....	1.60	1.60	1.60	1.60
Angles, Tidewater.....	1.74½	1.74½	1.74½	1.74½
Angles, Pittsburgh.....	1.60	1.60	1.60	1.60
Skelp, Grooved Steel, Pittsburgh	1.50	1.50	1.50	1.32½
Skelp, Sheared Steel, Pittsburgh.	1.55	1.55	1.55	1.32½
Sheets, No. 27, Pittsburgh.....	2.15	2.15	2.20	2.00
Barb Wire, f.o.b. Pittsburgh....	2.25	2.25	2.25	2.50
Wire Nails, f.o.b. Pittsburgh....	1.80	1.80	1.80	1.90
Cut Nails, Pittsburgh.....	1.80	1.80	1.80	1.75

METALS:

Copper, New York.....	15.00	15.00	15.00	12.62½
Spelter, St. Louis.....	5.25	5.17½	5.07½	4.77
Lead, New York.....	4.55	4.55	4.50	4.20
Lead, St. Louis.....	4.50	4.50	4.42½	4.12½
Tin, New York.....	31.75	31.40	30.55	26.40
Antimony, Hallett, New York...	13.00	13.00	11.50	7.25
Nickel, New York.....	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York.....	3.74	3.74	3.74	3.64

Chicago.

FISHER BUILDING, July 18, 1905.

The most important event of the week is the advance in the price of Pig Iron. The turning point referred to in last week's report has come and a number of the Southern furnaces are staying out of the market altogether for anything below \$11.50, while others are quoting at least 50c. higher than they were a week ago. Northern furnaces are firmer and it seems as if the time had come when sellers can name terms. Notwithstanding the 70,000 tons surplus accumulated during the month of June in Southern furnace yards the Foundry Iron market is considered statistically strong because melters are believed to have allowed their stocks to run down much more rapidly than furnaces have accumulated stocks. In Finished Iron and Steel a heavy demand has developed for Standard Section Steel Rails and inquiries aggregate from 75,000 to 100,000 tons, while actual sales closed during the week are possibly 15,000 tons. Plates grow stronger with every week's report and mills are falling farther behind in their shipments. In Structural Steel the situation is even worse because the demand for building materials is increasing rapidly, in spite of the fact that the mills are booked very far ahead. How much relief can be furnished by the Lackawanna Steel Company and the new mill of the Eastern Steel Company remains to be seen. It looks as if the time is not far distant until we will again be on an importing basis, not because of price, but on account of delayed deliveries from domestic mills. Bars are also gaining in strength and more and more consumers are compelled to pay the full 1.50c., Pittsburgh, basis, for Steel. Bar Iron is also stronger, not only because of the strength of Steel, but also on account of the increasing cost of Scrap.

Sheets are weak as ever, and this product and Pipe mark the soft spots in the Iron and Steel situation to-day. Pipe is weak because of the disappointment on the part of both producers and jobbers as to the result of the consuming demand. Wet weather has prevailed throughout the West to such an extent that Pipe consumption has been held to its minimum. Boiler Tubes are as strong as Pipe is weak. Cast Iron Pipe mills are very generally busy. Old Materials are still being bid up in price by large dealers, who are evidently satisfied that consumers cannot much longer stay out of the market. Coke shares in the new strength of Pig Iron. Wire products are seasonably quiet, but the undertone is strong.

Pig Iron.—The upward turn in the market predicted last week has been realized and the situation seems to be very strong from the standpoint of the producer. Southern Irons are now firm on the basis of \$11.50, Birmingham, for No. 2, either for spot or for August and September shipment, with \$12 asked for the fourth quarter. Belated buyers, who refused to believe that \$10.75 was the bottom of the market last week, are now paying \$11.50, and there is a possibility that some will pay at least \$12 basis. Furnace representatives in this market are none too anxious to book business even at \$11.50 and are waiting for it to come in rather than going out for it. Northern Irons have advanced correspondingly, the advance, however, revealing the fact that they had been much weaker previously than the producers would acknowledge. Local furnaces are now squarely on the basis of \$16 at the furnace for No. 2 for third quarter and \$16.50 for fourth quarter, where they were selling at \$15.50, furnace, a week ago. For delivered price, Chicago, from 25c. to 50c. must be added to these figures. Large blocks of Malleable Pig Iron have been placed within the last two or three days, aggregating possibly 20,000 tons, though details are not available. A local interest bought something like 10,000 tons of Basic Iron for delivery the balance of this year and another local buyer has closed, or will close before this report is read, for something over 5000 tons. An order for 10,000 tons of Foundry Iron was placed in St. Louis by a large car interest, and local car wheel industries have also bought liberally. Buying of Foundry Irons is done as a usual thing in relatively small blocks, as the foundrymen seem to be satisfied to cover their requirements for only a short period in advance, notwithstanding the fact that many of them have entered into contracts to furnish castings the balance of the year. Though there is some skepticism as to the permanency of the present bulge in Iron, there is no doubt about its immediate strength, and there is even a fear expressed that before the close of the year there may be a runaway market. We quote the following prices for spot and third quarter delivery, with the understanding that business for the fourth quarter is quoted as a general thing 50c. higher.

Lake Superior Charcoal.....	\$16.50 to \$17.00
Northern Coke Foundry, No. 1.....	16.75 to 17.00
Northern Coke Foundry, No. 2.....	16.25 to 16.50
Northern Coke Foundry, No. 3.....	15.75 to 16.00
Northern Scotch, No. 1.....	17.00 to 17.50
Ohio Strong Softeners, No. 1.....	17.30
Ohio Strong Softeners, No. 2.....	16.80
Southern Silvery, 4 to 6 per cent. Silicon	16.15 to 17.15
Southern Coke, No. 1.....	15.65 to 16.15
Southern Coke, No. 2.....	15.15 to 15.65
Southern Coke, No. 3.....	14.65 to 15.15
Southern Coke, No. 4.....	14.40 to 14.90
Southern Coke, No. 1 Soft.....	15.65 to 16.15
Southern Coke, No. 2 Soft.....	15.15 to 15.65
Southern Gray Forge.....	14.15 to 14.65
Southern Mottled and White.....	13.90 to 14.40
Malleable Bessemer.....	16.50 to 16.75
Standard Bessemer.....	16.80 to 17.05
Jackson Co. and Ky. Silvery, 6 to 8 % Silicon	18.30 to 18.55
Jackson Co. and Ky. Silvery, 8 to 10 % Silicon	20.30 to 20.55
Alabama Basic.....	16.15 to 16.65

Billets.—Notwithstanding repeated reports that Billets can be purchased in Pittsburgh at \$22 to \$22.50 for either Bessemer or Open Hearth and \$23.50 to \$24 for Sheet Bars, Billets are still scarce in this market and are not obtainable, as far as can be learned, at less than \$28, the price ranging from there up to \$30 and above, with Sheet Bars quoted at corresponding prices.

Rails and Track Supplies.—We have entered a period of intense activity in inquiry for Standard Section Rails, inquiries now in the hands of local interests aggregating nearly 100,000 tons. Something like 10,000 tons have been closed for the week under review with the Carnegie mills, with smaller tonnages for other producers. Railroads evidently are reaching the conclusion that they waited too long, and are anxious to get under cover before the mills shall be so full of business that their orders will be delayed beyond the time when the Rails are required. Demand for Light Section Rails is also in excellent condition, with a good trading in lots ranging from car lots up to 500 tons. Prices on Standard Section Rails are firm at \$28, f.o.b. mill, with full freight to destination. Light Section Rails down to 12-lb. Sections are offered at \$24 to \$27 a gross ton, f.o.b. mill, while 10-lb. and 8-lb. are offered at \$28 and \$29. Angle Bars are unchanged at 1.40c. to 1.50c. Spikes are rather

weak at 1.70c. to 1.75c., f.o.b. mill, in car lots, Eastern mills offering 1.70c. and Pittsburgh mills holding at 1.75c. or above. Track Bolts are quoted at 2.40c. to 2.50c., base, Square Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Material.—No buildings of any magnitude have been awarded during the week under review, but current requirements both from mill and store continue to be heavy. There is a prospect that before the winter is over we will have a repetition of the condition of the market during the winter of 1902-3, when large tonnages of Structural Material were imported from England and Germany, though domestic interests will use every endeavor to prevent this. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2.10c. to 2.50c., according to quantity on hand in store or obtainable from mill.

Plates.—Specifications on the local mill are extremely heavy and rolling orders are already entered that will keep the mill busy, double turn, for 90 days, while tonnages on contract are sufficient to keep the plant fully occupied to the end of the year. An increasing tonnage of Plates for Western users is constantly going to Eastern mills. The two large interests at Coatesville, Pa., are still promising ten days to two weeks shipment, but they are rapidly filling up. Prices are unchanged and firm, as follows: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, Tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—The Sheet mills and galvanizing plant of the Inland Steel Company, at Indiana Harbor, resumed operations after the annual shutdown, Monday, July 17. The Sheet market continues to be weak, with no relief immediately in sight. Actual going prices on Sheets are about as follows: Blue Annealed, Nos. 9 and 10, 1.81½c. to 1.86½c.; Box Annealed, Nos. 18 and 20, 2.11½c. to 2.16½c.; No. 27, 2.31½c. to 2.36½c.; No. 28, 2.41½c. to 2.46½c., with the customary differentials between gauges. Store prices are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.50c. for Nos. 18 and 20 Box Annealed, 2.65c. for No. 27 Box Annealed and 2.75c. for No. 28 Box Annealed. Galvanized Sheets are quoted in car lots from mill at about the following prices, some mills asking a little more and some offering at \$1 a ton less: No. 10, 2.41½c. to 2.46½c.; Nos. 17 to 21, 2.81½c. to 2.86½c.; No. 27, 3.31½c. to 3.36½c.; No. 28, 3.51½c. to 3.56½c. Store prices on Galvanized Sheets are as follows: Nos. 10, 12 and 14 are selling at from 3c. to 3.10c., Nos. 22 and 24 at from 3.05c. to 3.15c., No. 27 at from 3.50c. to 3.65c. and No. 28 at from 3.70c. to 3.95c., with intermediate gauges in proportion and with customary differentials for widths and lengths.

Bars.—The gradual advance in the price of Scrap is strengthening Bar Iron to a point where 1.45c. is no longer named by the larger producers at least and where 1.52½c. to 1.55c. is the going price. It is probable that specially desirable business can still be placed in large tonnages for nearby delivery at 1.50c. Steel Bars grow stronger with the gradual absorption of materials bought on old contracts. Mills are as a general thing very full of business, and the contracting movement among the large implement firms and other extensive users of Bars is beginning to take form. We quote Iron Bars 1.50c. to 1.55c.; Steel Bars, 1.66½c., both half extras; Hoops, 1.81½c., rates, full extras; Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—Specifications are seasonably light, and it is estimated that 80 per cent. of the contract tonnage on disks, colters, rake teeth, knife backs and other specialties has already been placed for either the last half of this year or for the full term up to July, 1906. It is

stated that an unusually large number of implement makers are running their plants throughout the summer, and for that reason an increase in specifications is looked for shortly. Current prices are unchanged, as follows, officially at least: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—Card prices, which should be taken as only nominal, are unchanged at 73.35, Chicago, to consumers for base sizes, ¾ to 6 inches, on Black Steel; 63.35 on Galvanized Steel, 71.85 on Black Iron, 61.85 on Galvanized Iron, with the customary differentials for larger and smaller diameters and X and XX strong. Prices being actually made to jobbers are 3 to 4 points better.

Boiler Tubes.—Weakness in Pipe is counterbalanced by strength in Boiler Tubes, particularly in locomotive sizes and gauges. The Tube mills are generally very full of business and prospects are for a continuation of the firm market. Official prices are as follows, f.o.b. Chicago, in car lots: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.85. Store prices are, nominally at least, unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	40	35	42½
1½ to 2¼ inches.....	50	35	35
2½ inches.....	52½	35	30
2½ to 5 inches.....	60	47½	42½
6 inches and larger.....	50	35	..

Cast Iron Pipe.—Columbus, Ohio, bought 1100 tons from the leading producer last week. Quite a number of smaller lots, ranging up to 500 tons, were placed by smaller municipalities. It is estimated that the leading producer is melting at least 40,000 tons of Pig Iron a month. We repeat prices, except for a slight reduction on 12-inch and larger, as follows: Water Pipe, 4-inch, \$29; 6, 8 and 10 inch, \$28; 12-inch and larger, \$27, per net ton, with \$1 extra charged for Gas Pipe. Large tonnages bought by municipalities on a competitive basis of course secured considerably lower prices.

Old Materials.—Railroads continue to get advancing prices on Old Materials, the high bidders being dealers rather than consumers. The only lists of consequence were those issued by the Chicago, Milwaukee & St. Paul last week and this week by the Northern Pacific. On Iron Rails \$17.80 seems to be the prevalent bid made by dealers to railroads and \$13.75 on Steel. A feature of the market is the fact that higher prices are sometimes offered for Rails 2 feet and under than for long lengths, this inquiry coming from manufacturers of Steel Castings who require short lengths. It is the general impression that a week later, under the impetus of the advancing prices in Pig Iron, consumers may enter the Scrap market for relatively large tonnages. The following range of prices fairly represents the market. These prices are per gross ton:

Old Iron Rails.....	\$17.75 to \$18.00
Old Steel Rails, 4 feet and over.....	13.75 to 14.00
Old Steel Rails, less than 4 feet.....	13.50 to 14.00
Heavy Relaying Rails, subject to inspection.....	23.00 to 23.50
Heavy Relaying Rails, for side tracks.....	19.50 to 20.00
Old Car Wheels.....	14.25 to 14.75
Heavy Melting Steel Scrap.....	13.00 to 13.25
Frogs, Switches and Guards.....	13.00 to 13.25
Mixed Steel.....	10.50 to 11.00

The following quotations are per net ton:

Iron Fish Plates.....	\$16.00 to \$16.25
Iron Car Axles.....	21.00 to 21.25
Steel Car Axles.....	15.50 to 16.00
No. 1 Railroad Wrought.....	14.00 to 14.50
No. 2 Railroad Wrought.....	13.00 to 13.50
Locomotive Tires, smooth.....	14.00 to 14.50
Railway Springs.....	12.50 to 12.75
Shafting.....	15.00 to 15.50
No. 1 Dealers' Forge.....	10.00 to 10.50
Wrought Pipes and Flues.....	10.50 to 10.75
No. 1 Cut Bushelling.....	9.50 to 10.00
Iron Axle Turnings.....	10.50 to 10.75
Soft Steel Axle Turnings.....	9.75 to 10.00
Machine Shop Turnings.....	9.75 to 10.00
Cast Borings.....	7.50 to 8.00
Mixed Borings, &c.....	7.50 to 8.00
No. 1 Mill.....	8.75 to 9.25
Country Sheet.....	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings.....	9.50 to 10.00
No. 1 Cast Scrap.....	13.50 to 14.00
Stove Plate and Light Cast Scrap.....	9.50 to 10.00
Railroad Malleable.....	12.25 to 12.50
Agricultural Malleable.....	11.75 to 12.00

Metals.—Pig Tin and Spelter both show marked advances, Pig Tin being now quoted on the basis of 32½c. to 33½c. for car lots and as high as 34c. in small lots. Spelter has advanced to a minimum of 5½c. for car lots and 5½c. to 6c. for small lots. Casting Copper is 14½c. to 15c.; Lake, 15c. to 15½c. in car lots, with ¼c. to ½c. higher for small lots. Lead is quoted in 50-ton lots at 4.55c., in car lots at 4.60c., and 5c. to 5.25c. in small lots. The new Sheet Zinc schedule is based on \$7, La Salle, for car lots of 600-lb. casks; car lots, Chicago, are sold on the basis of \$6.75, with small lots selling at from \$7 to \$7.50 per 100 lbs. Prices of

Old Copper and Brass are as follows: Copper Wire, 13½c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12½c.; Red Brass, 11½c.; Red Brass Borings, 9½c.; Yellow Brass, Heavy, 8½c.; Yellow Brass Borings, 7½c.; Light Brass, 7c.; Lead Pipe, 4½c.; Tea Lead, 3.85c.; Zinc, 4c.; Pewter, No. 1, 19½c.; Block Tin Pipe, 25c.

Coke.—Coke prices are unchanged, but the market is stronger in tone, and Connellsville Foundry Coke is hard to obtain on the basis of \$4.90, Chicago, prices usually ranging from \$5 to \$5.15. Foundry Coke, from less favored regions, run 25c. to 50c. a ton less. Wise County, Va., product is firm at \$2.25, at the ovens, or \$4.50, Chicago.

Pittsburgh.

PARK BUILDING, July 19, 1905. (By Telegraph.)

Pig Iron.—There has been a heavy movement in Southern Pig, and all the prominent Southern interests have advanced prices. The largest single buyer was the Cast Iron Pipe interest, which takes 35,000 tons or more. Altogether reports here indicate that 75,000 tons or more of Southern Iron have been sold in the past week. Some comparatively small lots of Forge and Foundry have been sold to this district, some at less than \$11, Birmingham, while last sales for early shipment were made at \$11. The leading Southern interest has advanced its prices to \$11.50 for third and \$12 for fourth quarter. Several other companies are following suit. Northern Foundry has been more active in the Valleys, 8000 to 10,000 tons of No. 2 being sold for various Ohio points, chiefly at \$14, Valley, some running up to \$14.25; but \$14 can still be done with one or two interests. Some furnaces hold stiffly to \$14.25 and others to \$14.50, furnace. Pittsburgh has been a poor buyer of Foundry Iron, local interests being less busy. A sale of 1000 tons of Forge to a local interest this week was made at \$14.50, Pittsburgh, or \$13.65, Valley. Several small lots of Bessemer, aggregating 5000 to 6000 tons, sold at \$14, Valley. Furnaces are now quoting \$14.25, Valley, or \$15.10, Pittsburgh, on Bessemer, some for delivery clear through the year, others only for third quarter. Basic is quoted at \$14 to \$14.25, Valley, with no sales of consequence. No business is likely to come to Valley furnaces on inquiries for 15,000 to 20,000 tons of Basic from Chicago interests. The monthly blast furnace report of J. G. Butler, Jr., of Youngstown showed that on July 1 87 per cent. of the capacity tributary to Lake Superior Iron mines was active, as against 92 per cent. June 1, being a decrease of 5 per cent. The Steel Corporation has 84 per cent. of its furnace capacity active, the Republic Iron & Steel Company 100 per cent., the Bessemer Furnace Association 98 per cent. and outside interests 87 per cent.

Steel.—There is quite an active inquiry for Billets and Sheet Bars, and there appear to be very few sellers outside of the leading interest, which quotes \$23 on Billets, \$24.50 for Long Sheet Bars and \$25 on Cut Bars. These prices have not been paid yet, the last sale of Sheet Bars being at \$23.85 on 500 tons. There is little or no tonnage available on the outside, one interest being closed, and others being busy with their own finishing departments. One outside interest is working on a conversion deal for 12,000 tons of Billets for a large Steel interest. Large sales of Sheet Bars are expected if the Sheet and Tin Plate demand grows as expected.

Wire Rods.—It is reported that \$31.50, Pittsburgh, can be done on Bessemer Wire Rods. Demand is very light.

(By Mail.)

There has been a slight improvement in Finished Steel tonnage since last report and a very marked augmentation of the improved sentiment which was noted last week. In Pig Iron there has been a very heavy movement in Southern grades, leading many Southern interests to advance their prices sharply. In Northern Iron the movement has only slightly increased, but inquiry is much heavier and furnaces feel in a much firmer position.

A considerable tonnage of Southern Iron has been sold in the local market in the past week or ten days on the basis of \$11, Birmingham, or \$15.35, Pittsburgh, and lower than this, down possibly to \$10.50, Birmingham. Most of the Southern furnaces have advanced their prices, the leading Southern interest yesterday fixing new prices at \$11.50 for the third and \$12 for the fourth quarter. A little Northern Foundry is to be had on the basis of \$14, Valley, but most furnaces ask a little more. On Basic \$14 is quoted and on Bessemer \$14.25, but these prices might be shaded a trifle on a round tonnage, deliveries to start at once. At the asking prices contracts could probably be made for delivery through the year.

In Billets and Sheet Bars there is a mild deadlock, the leading interest having fixed prices for the quarter somewhat above buyers' views, at \$23 for Billets, \$24.50 for Long Sheet Bars and \$25 for Cut Bars. A very limited tonnage has been available from other sources, but it is believed this will be cleaned up very shortly. We note a sale of 500 tons of Long Bars at about \$23.85, f.o.b. Pittsburgh mill.

The Republic Iron & Steel Company started its new Rail mill Sunday night last and on Monday rolled 400 tons of Rails. It is understood that orders for about 35,000 tons of Rails have been booked by this mill. With the various demands upon the converters more difficulty will be experienced in finding the Steel than in rolling the Rails. The Carnegie Steel Company will start the Shenango Valley Steel Works at New Castle next Sunday night and about Friday will turn on the blast at the three blast furnaces which have been banked while the Steel works have been idle. This will leave the company with but ten idle blast furnaces, including the large stack at Youngstown, which was recently blown out suddenly for repairs and which will start in about two weeks; the two Columbus furnaces, which will be blown in provided the demand for Sheet Bars requires the starting of the Columbus Steel Works, one Edgar Thomson and one Lucy, both regular Spiegel and Ferro furnaces, and some small detached furnaces.

In those more finished lines which have lately been dull, including Merchant Pipe, Wire Products, Sheet and Tin Plates, the reports are all more encouraging. It is evident that stocks have been heavily drawn upon and are greatly reduced. There is somewhat increased buying in Sheets, leading one or two mills to advance their prices, while others will not name their inside figures except on more attractive tonnages than formerly. In Merchant Pipe increased buying is expected within a short time.

Ferromanganese.—Inquiry is only for small lots, consumers having loaded up rather heavily on the recent scare growing out of the situation in Russia. It is accepted now that there will not be any serious trouble in getting either Ore or Ferro. The Carnegie Steel Company, which recently blew out a Lucy and an Edgar Thomson furnace, both making Ferro and Spiegel regularly, will start them shortly, being assured of a supply of Ore. We quote prices unchanged at \$49.50 on small lots of either foreign or domestic 80 per cent.

Rods.—The market is quiet and we continue to quote ordinary lots at \$32 for Wire Rods and \$33 for Chain Rods, f.o.b. Pittsburgh.

Steel Rails.—An inquiry for 25,000 tons and another for 30,000 tons have been received this week and the orders are likely to be placed promptly. Meanwhile orders for from 1000 to 5000 tons are being placed right along. Rail production in the second half of this year may be double that of the first half. When the decision was reached late in June to change the Ohio works of the Carnegie Steel Company at Youngstown from Billets and Sheet Bars to Rails there was business in sight for only a 30 or 60 day run, but now it is pretty certain that this mill will have to be kept on Rails until nearly the close of the year, with Lorain on Standard Sections and Edgar Thomson and Chicago running full, both these mills being behind. New orders can only take their turn, as all the postponing which can be arranged with the railroads has already been done. We quote Standard Sections at \$28 at mill and Light Rails at \$22.50 to \$25, according to weight.

Skelp.—The market is very quiet and there are no signs of improvement until the expected increase in Pipe demand materializes. We quote Bessemer Grooved Skelp at 1.50c. to 1.55c. and Open Hearth 1.55c. to 1.60c., with \$1 advance for Sheared. Grooved Iron Skelp is about 1.60c. and Sheared 1.67½c. to 1.70c., maker's mill. On a firm offer the above prices would no doubt be shaded.

Plates.—No change in prices is expected to be made at the meeting of Plate mills in New York this week. In addition to two inquiries aggregating 8000 cars, noted last week, the Steel car works are in receipt of two or three additional inquiries involving a large number of cars. No orders have been placed as a result of these inquiries as yet, but a good buying movement in Steel cars is expected shortly, the railroads generally doing such things by spurts. All but a half dozen of the lake berths are engaged for next year. The attitude of the leading Plate mills is that it will be satisfactory if consumers buy Plates for next season at the present prices, making an advance over the prices ruling on old contracts, on which tonnages are still being delivered. We quote prices firm and without change, as follows: Tank Plates, ¼ inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges.....	\$0.10
Gauges No. 7 and No. 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.20
Plates over 125 to 130 inches.....	.25
Plates over 130 inches.....	.50
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches).....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
Marine, "A. B. M. A." and ordinary Fire Box Steel Plates.....	.20

Still Bottom Steel..... .30
Locomotive Fire Box Steel..... .50
Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—A meeting of the mills making Structural Shapes will be held in New York this week. Some of the smaller Eastern mills are obtaining premiums where they can make prompt deliveries of certain sizes and such mills would like to see an advance in the regular price, but such a programme can hardly be put through with the leading mills committed to unchanged prices. All yards are bare of stocks and any sizes required have to be made, but there is less difficulty than would usually be experienced in such circumstances, because fabricators have been unusually foresighted in placing specifications. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—Stocks are being rapidly reduced, as scarcely any of the union mills have been started since the recent shutdown and a number of nonunion mills are idle. The mills are confronted with the prospect of having to pay more money for Steel than they anticipated a month ago and are hardly so ready to book tonnage. One or two mills which have booked rather heavily have advanced their prices. We quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 gauge, 2.05c. to 2.10c.; No. 26, 2.15c. to 2.20c.; No. 27, 2.15c. to 2.20c.; No. 28, 2.25c. to 2.30c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.75c. to 2.85c.; Nos. 25 and 26, 2.95c. to 3.05c.; No. 27, 3.13c. to 3.23c.; No. 28, 3.35c. to 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.65 to \$1.75 per square, and Galvanized Roofing Sheets, No. 28 gauge, at \$2.85 to \$2.95 for 2¼-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—Specifications are considerably improved in Steel Bars, but new business continues light. There is less shading out West, where some jobbers were disposing of accumulations, and a steadier market is expected in all sections. Some of the local mills are several weeks behind in specifications. In Iron Bars there is not much doing and producers are not pressing sales, as the season is not conducive to very active operations in Iron mills. We quote common Iron Bars at 1.55c. to 1.60c., Pittsburgh, and 1.55c., Youngstown; Steel Bars are 1.50c., base, for carload and larger lots, the latter subject to occasional shading by jobbers having old contracts.

Hoops and Bands.—The market is without change, specifications being good and some new business coming in at full prices—1.65c. for Hoops and 1.50c. for Bands, with the usual extras on the latter.

Tin Plate.—One of the small union Tin mills in this district signed the scale Saturday and started this week. Two of the larger union Tin mills will not start before August 1 or later. The two New Kensington plants of the leading interest have been put in operation. Most of the other nonunion mills of this interest are operating, while the union mills are closed. At the Sharon and Shenango plants extensive repairs and changes are being made and these plants will not be started for some weeks. Demand for Tin Plate is very quiet, but is expected to improve next month, when stocks of Tin Plates and cans are expected to be pretty well used up and when the fall canning season will be on. There is some shading in Cokes, and there are occasional reports of shading in Heavy Coated Ternies, in which latter case it is suspected the coating is not up to specifications. It is believed that there is considerable short interest in Cokes. We quote the regular price at \$3.55 for 100-lb. Cokes, with the 5c. rebate, f.o.b. Pittsburgh, 30 days, less 2 per cent. for cash in 10 days.

Merchant Steel.—Some new tonnage is being placed, but there is not much season contracting. Prices are fairly firm and we quote: Flat Sleigh Shoe, 1.50c. to 1.55c.; Toe Calk Steel, 2c. to 2.05c.; Smooth Finished Tire, 1.65c. to 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Railway Spring Steel, 1.65c. to 1.70c.; Crucible Tool Steel, 5½c. to 8c. for ordinary grades; special grades, 12c. and upward. Shafting is in fair demand, discounts being 50 per cent. off in carloads and 45 per cent. in less than carloads. For delivery at certain competitive points these discounts are slightly shaded by one or two concerns.

Spelter.—Since our last report, quoting 5.22¼c., Pittsburgh, sales have been made at 5.25c., and asking prices have further advanced to about 5.30c., causing consumers to hold off to see whether the advance can be made effective.

Merchant Pipe.—There has been no improvement in

tonnage since last report, but advices are generally of a more favorable character, and better business is expected next month. The market is fairly well maintained on the basis of last December, since when official prices have been successively advanced two points, making discounts to jobbers as follows:

	Merchant Pipe.		Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
1/4 and 1/2 inch.....	67	51	65	49
3/4 and 1 inch.....	71	59	69	57
1 1/2 to 6 inches.....	75	65	73 1/2	63 1/2
7 to 12 inches.....	70	55	68 1/2	53
Extra strong, plain ends, 1/2 to 3/4 inch.....	60	48	58	46
1/2 to 4 inches.....	67	55	65	53
4 1/2 to 8 inches.....	63	51	61	49
Double extra strong, plain ends, 1/2 to 8 in.....	56	45	54	43

Boiler Tubes.—Demand continues good, with mills behind in deliveries and prices well maintained. Discounts are as follows:

	Iron.	Steel.
1/4 to 1 1/4 inches.....	41	44
1 1/4 to 2 1/4 inches.....	41	56
2 1/4 inches.....	46	58
2 1/2 to 5 inches.....	53	64
6 to 13 inches.....	41	56

Coke.—The Coke market has been quiet. Strictly Connellsville Furnace Coke is held at \$1.85 for third quarter, while for fourth quarter \$2 to \$2.10 is asked. Small lots for early shipment might be had at a trifle under \$1.85. Foundry Coke is selling at \$2.35 to \$2.40 for strictly Connellsville. Outside makes are held at prices ranging down to \$1.50 for Furnace and \$2 for Foundry. Crushed Coke is \$1.90 to \$2, all prices being f.o.b. ovens.

Iron and Steel Scrap.—There is a better feeling in the Scrap market and it is believed it would pay to hold Scrap. The Baltimore & Ohio is out with a fairly large list, bidding on which closed last night. More interest than usual is shown in this offering. Consumers, however, are not yet in the market to any extent. We note a sale of Heavy Melting Stock at \$14.25, delivered, and quote Heavy Melting Scrap at \$14 to \$14.50, depending altogether on the tonnage: No. 1 Wrought Scrap, \$14.50 to \$15; Cast Borings, \$8 to \$8.25; Bundled Sheet Scrap, \$12.50; Cast Scrap, \$14 to \$14.25; Wrought Iron Turnings, \$12.75; Old Steel Rails, short lengths, \$14 to \$14.50; long lengths, \$14.50 to \$15, all gross tons, delivered, Pittsburgh.

Philadelphia.

REAL ESTATE TRUST CO. BUILDING, July 17, 1905.

The Iron and Steel markets have swung around considerably during the past few days. Those who would hardly consider a proposition to buy Iron a week ago are now glad to receive quotations subject to short options, which are not given indiscriminately. The change of tone is remarkable and certainly indicates a strong buying movement in the near future. As to prices, it is impossible to say how far they will move, but it may be taken for granted that it will not be toward lower figures. Neither is it likely that they will be run up very rapidly; just a gradual stiffening until about next month, and then the movement may be something akin to that during the first quarter of the year. The experience of buyers during and since that period may check the tendency to buy for long date delivery, but that requirements during the remainder of the year will be large seems to be fully assured; so that buying must be in proportion.

This applies to Iron and Steel of every description, but it will probably be seen in Pig Iron before it reaches the more advanced products, but everything indicates an immense volume of business extending for an indefinite period. The statistical position as shown by *The Iron Age* last week cannot be considered unfavorable if the demand is going to increase, although it would be so in case the improvement was likely to be postponed. It must be conceded that the movement has come a little ahead of schedule time. Western ideas were that there would be no great improvement until September, while in this territory August was expected to see it well under way, and it looks as though that would be about right. Of course a firm foundation in regard to values must be established, but last week's quotations are thought by some to be as low as any that will be seen during 1905. It will take two or three weeks before prices are fully settled. Some low figures have been quoted during the past week or two, and as they become known others will try to get in on similar terms, but the opportunity for concessions has probably been passed for this year's business. Still, this is only a preliminary stage and changes may intervene which will modify the entire situation, though, as we said before, the immediate outlook is very encouraging.

Pig Iron.—A remarkable change has come over the market. Buyers are ready to talk business and are evidently disposed to make new contracts or to extend those that are running out. The situation is made somewhat difficult from the fact that extremely low prices have been accepted from

a class of buyers who are recognized as first class, and as in other cases options were given covering the greater portion of the month it is pretty certain that the average of sales will prove to have been at extremely low figures. Others who were late in making the inquiries will have to pay more money, although when it is known that lower prices have been accepted it will take time to reconcile them to new figures. The trend of events is inexorable, however, and when the market begins to move consumers must move with it, and in fact it is seldom a matter of choice but of necessity. Inquiries for Pig Iron have been very numerous this week and include almost every variety of Iron that is made. Basic, Bessemer, Malleable, Foundry and Mill Irons have all been asked for in good sized lots and sales have been made in considerable quantities. Bessemer is quoted at about \$16.75. Basic has been sold at something below \$15.50, delivered; Southern Gray Forge at \$13.50; No. 2 X at about \$15; Northern Gray Forge at \$14.25 to \$14.50 and No. 2 X Foundry at \$16 to \$16.25. To-day's asking prices are higher, however, and it is doubtful if any concessions can be had from the following quotations, which are for Philadelphia and other nearby points:

No. 1 X Foundry.....	\$17.25 to \$17.50
No. 2 X Foundry.....	16.25 to 16.50
No. 2 Plain.....	15.75 to 16.00
No. 3 Foundry.....	14.75 to 15.25
Standard Gray Forge.....	14.50 to 14.75
Basic.....	15.00 to 15.50
Low Phosphorus.....	20.25 to 20.50
Southern No. 2 X Rail.....	15.25 to 15.50
Southern No. 2 X, on dock.....	14.50 to 14.75
Southern Gray Forge.....	13.50 to 14.00

Ferromanganese.—No sales. Nominal prices, \$47 to \$47.50, on dock.

Steel.—There is an active demand and prices are strong at \$26 to \$26.50 for Open Hearth Steel. The inside figure is for large lots only and for prompt specification; small orders are at somewhat higher figures than above quoted.

Muck Bars.—No sales are reported, but business is expected in the near future at something around \$28, seller's mill.

Plates.—Reports vary somewhat. Some mills during the past few days have taken quite a nice line of business, others have had only the usual run of small orders, but the general situation is quite satisfactory. Prices are unchanged as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide.....	1.73 1/2	1.78 1/2
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under.....	1.63 1/2	1.68 1/2
Flange or Boiler Steel.....	1.83 1/2	1.88 1/2
Marine, A. B. M. A. and Commercial Fire Box Steel.....	1.93 1/2	1.98 1/2
Still Bottom Steel.....	2.03 1/2	2.08 1/2
Locomotive Fire Box Steel.....	2.23 1/2	2.28 1/2
The above are base prices for 1/4-inch and heavier. The following extras apply:		
3-16-inch thick.....	\$0.10	pounds extra.
No. 7 and S. B. W. G.....	.15	"
No. 9, B. W. G.....	.25	"
Plates over 100 to 110 inches.....	.05	"
Plates over 110 to 115 inches.....	.10	"
Plates over 115 to 120 inches.....	.15	"
Plates over 120 to 125 inches.....	.25	"
Plates over 125 to 130 inches.....	.50	"
Plates over 130 inches.....	1.00	"

Structural Material.—Business in this line is active in all departments. Some mills are so overcrowded that deliveries cannot be promised until late in the year, and in some instances makers decline to quote at all, simply because they do not know when they can make deliveries. Prices are as follows: Beams, Channels and Angles, 1.73 1/2 c. to 1.85 c., according to specifications, and small Angles, 1.65 c. to 1.68 c.

Sheets.—Not much demand appears for Sheets, but prices are steady and prospects are considered favorable for the fall trade. Prices are about as follows: 18 to 20 gauge, 2.30 c.; 22 to 24 gauge, 2.40 c.; 25 and 26 gauge, 2.50 c.; 27 gauge, 2.60 c., and 28 gauge, 2.70 c.

Old Material.—There is a much better feeling in Scrap Material and holders are quoting 50 c. to \$1 advance; in some instances more than that. Lots that have to be moved immediately sometimes go at near to last week's prices, but it is believed that the upward movement is genuine and will be carried somewhat further. Bids and offers for lots delivered in buyers' yards are about as follows:

Scrap Rails.....	\$16.00 to \$16.25
No. 1 Steel Scrap.....	15.50 to 16.00
Old Steel Axles.....	16.50 to 17.00
Old Iron Axles.....	21.00 to 22.00
Old Iron Rails.....	17.50 to 18.50
Old Car Wheels.....	14.00 to 14.50
Choice Scrap, R. R. No. 1 Wrought.....	16.00 to 16.50
No. 1 Yard Scrap.....	14.00 to 15.00
Long and Short.....	13.50 to 14.00
Machinery Scrap.....	14.00 to 14.50
Wrought Iron Pipe.....	12.00 to 12.50
No. 1 Forge Fire Scrap.....	12.50 to 13.00
No. 2 Light, Ordinary.....	10.00 to 11.00
Wrought Turnings.....	11.00 to 11.50
Axle Turnings, Choice Heavy.....	12.50 to 13.00
Cast Borings.....	8.00 to 8.50
Stove Plates.....	10.00 to 10.50

Cleveland.

CLEVELAND, OHIO, July 18, 1905.

Iron Ore.—The Colorado Fuel & Iron Company has closed a contract with Corrigan, McKinney & Co. of Cleveland for a block of Stevenson Ore, to be delivered during the balance of the year at the rate of 600 to 700 tons a week. This is the first movement of Ore from the Lake Superior territory to the West. The Western concern has bought the Ore to piece out its needs until some new sources of production yield the required amounts. The business originating on the Great Northern Railroad will be controlled by that system. It is the intention to move the Ore via the Great Northern to Sioux City and thence via the Northwestern to Omaha, where it will be taken by the Burlington for shipment into Denver. Since there had been no through tariff on Ore, this movement not having been anticipated, it was necessary to make a special commodity tariff for this movement. The Lake Ore situation is getting tighter. It begins to appear that shippers have started a campaign for lower wild Ore rates for this summer. The wild cargoes have been almost completely withdrawn from the market and the movement has been seriously curtailed. The statement is made that there is no dock room at the lower lake ports and that the furnaces have been receiving Ore so rapidly that it is impossible for them to handle all of it. It seems impossible now, without a resumption of the speed of shipment shown last month, to move the 30,000,000 tons during the season which has been expected. In certain respects the statements explaining the necessity of easing the shipments are considered as part of the campaign to lower lake freight rates. The vessel owners are still holding for the contract rates on wild cargoes—namely, 75c. from Duluth, 70c. from Marquette and 60c. from Escanaba.

Pig Iron.—The statement is made that an organization has been formed in this territory among buyers of Pig Iron, with some intimation that it also extends its scope to some finished materials. The existence of the organization is said to have been revealed through the tracing of the source of supply of Pig Iron of one big consumer who was short of material and yet is known not to have bought on the open market, although his needs were met. His supply is reported to have come from a competitor who bought a certain surplus when prices were low. The report, although general among Pig Iron producers here, lacks the confirmation of any member of the supposed pool of consumers. At a recent meeting it was suggested that a lot of about 10,000 tons be bought for distribution among local foundrymen, but nothing in the way of definite action was taken. The local market is dull and listless, but prices are considered to be about at rock bottom. No. 2 Foundry is quoted at \$14 in the Valleys, but furnaces are not disposed to sell at these figures for future delivery. The activity in Southern Irons in other markets has stiffened the views of furnacemen somewhat. In Basic, Bessemer and Malleable the market has struck a dull streak, and buyers seem to believe these Irons will yet sell cheaper. One buyer came into the market and offered to pay \$13 at the furnace and expected to get the material. The Coke market is dull, with prices easy. The best grades of 72-hour Foundry Coke are selling at \$2.50 at the oven, and Furnace Coke is selling at \$2.

Finished Iron and Steel.—The market has been strong in sentiment, although sales have not increased, except in Steel Bars, where the demand is strong. Reports from all Central Western markets indicate that sales of this material were on a liberal scale during the week. The Cleveland territory supplied a good share of these orders, due to the fact that many of the agricultural implement works have begun to cover their needs for the year. It is true the larger consumers have not yet come in to cover in this territory, but the most of the smaller ones have and have taken liberal amounts, which size up well with the orders placed in the same period a year ago. All the contracts made are at the present price of 1.50c., Pittsburgh, for both Bessemer and Open Hearth, and complaints are unusual except among the very largest consumers, who have taken exceptions to the advance since they last bought and have endeavored to compel a reduction. The demand for Structural Steel very plainly exceeds the supply, and the price does not seem to be very seriously considered. The larger interests are well sold up until November 1 and are willing to take orders only through the remainder of this year, although the inquiries are coming in for material for the rest of this year and the first quarter of next. The association price of 1.60c., Pittsburgh, rules on advance delivery, although on material for quick shipment the prices run \$2 to \$5 a ton higher. The demand for Sheets is just fair, with the smaller mills still cutting prices some in order to get business. In the main, however, prices are steady at 2.15c. for No. 10 Blue Annealed out of stock, 2.65c. for No. 28 One Pass Cold Rolled out of stock and 3.65c. for No. 28 Galvanized out of stock. The market for Rails is steady and that for Billets continues good, but without any change.

Old Material.—Buyers are still holding off, and the dealers are waiting for them to get ready, making no new sacrifice to start buying. The accumulation of stocks is continuing at a rather rapid pace. We continue to quote, all gross tons: Old Steel Rails, \$13.50 to \$14; Old Iron Rails, \$20 to \$21; Old Car Wheels, \$15 to \$15.50; Heavy Melting Steel, \$13.50. All net tons: Cast Borings, \$7 to \$7.50; No. 1 Busheling, \$12; No. 1 Railroad Wrought, \$14 to \$14.50; Iron Axles, \$21 to \$22; No. 1 Cast, \$12.50 to \$13; Stove Plate, \$8.50 to \$9; Iron and Steel Turnings and Drillings, \$9.

Birmingham.

BIRMINGHAM, ALA., July 17, 1905.

During the past week the Rubicon was passed and a small army of buyers then took the market for Iron and captured thousands of tons where recently they had been content to make reprisals by the hundreds. In at least one instance a lot of 12,000 tons was secured by one of the principal buyers. There is some obscurity yet as to the basis of the sale, as only a part of the order was taken in this district. It is current gossip that 4800 tons went from the Bessemer, Ala., furnaces and the balance went from the Pittsburg, Tenn. Officially no particulars could be obtained, but it is current gossip that the average of the entire lot was \$10.41.

This purchase turned the tide and started the buying wave. In amount it did not fill all the requirements of the buyer, for on Friday he took 1000 tons each of Nos. 3 and 4 Foundry and Gray Forge on the basis of \$11.25 and was still in the market. He got some more, but the amount is withheld. As the sale became known other orders followed in quick succession, and those who wanted to sell did not have to hunt for buyers. Buyers hunted them up and affairs got right lively. Those who had been willing to accept \$10.75 rather than miss a sale were quick to mark prices up to a basis of \$11.25 for No. 2 Foundry for delivery within 90 days. It was enlivening to note how soon the buyers came to the support of the market, more readily accepting current offerings than when they were quoted 25c. and 50c. lower.

From one afternoon at 3 o'clock till noon of next day one interest had inquiries for 30,000 tons and accepted from one-third to one-half the orders. The sales for the week will approximate 50,000 tons; some conservative members of the trade place them at 60,000 tons. They are sufficiently large to confirm the assertion that the buying wave is upon us and doing business. There was one sale of 600 tons, delivery in 30 days, at special price. Your correspondent saw some orders accepted for single car lots at \$12 for No. 2 Soft and No. 2 Foundry. There were sales of lots of 100 tons, 200 tons, 500 tons and on up to 1000 tons, of which several were made. Then there were lots of 2500 tons, 2000 tons and 1500 tons down to car lots, and the basis of the sales ranged from \$12 down to \$11, depending upon circumstances.

The market during the week about regained what it lost the previous week and it closed with every prospect of a continuance of the activity. There was noted a return to the market of buyers who had been holding off for weeks waiting for bargains. The buying was not limited to any particular line, but embraced them all.

Some dealers were out of the market and announced that they would not sell under \$11.50 for No. 2 Foundry. Nearly all are talking \$12 Iron now, and if it goes to that the trade will be fed rather freely. At the close there was an inquiry from one Pipe works for 2000 tons, besides several others that were in negotiation. No Basic Iron is offered. Some talk is heard of increased production, but one can see but little prospect of material improvement in that respect.

The market for Scrap Iron shows a few changes in values and the demand is limited. Quotations are about as follows:

Stove Plate.....	\$8.50
Heavy Castings.....	10.50
Old Steel Rails.....	13.00
Old Iron Rails.....	18.00
Open Hearth Steel Scrap.....	13.00
Iron Car Axles.....	16.00
Steel Car Axles.....	14.00
Old Car Wheels.....	\$14.00 to 15.00
Relaying Rails, Light.....	22.00 to 24.00
Relaying Rails, Heavy.....	24.00 to 25.00
Railroad Wrought.....	15.00

Something is doing in the way of opening new Coal mines, and the Star Cahaba Coal Company is installing all the new appliances for mining coal with a view to increased output and diminished cost. The committee of miners, after an examination of the books of commercial operators, announced that the scale of wages for the Coal miners this month would be 2½c. less, say 55c. per ton. The market for Coke has been more active than for some time past and the sales were from 60,000 to 75,000 tons, delivery running throughout the year. But for a cut rate that is almost certain to expire in the immediate future Coke could not be laid down here under \$4; and it is very doubtful if any new business could be worked for less. The demand for

Coal is slack enough to make it easy for delivery on orders. The price remains at \$1 to \$1.25 for run of mine and at the mine tipple.

The question of labor is now having earnest consideration and a plan is being formulated to advertise in newspapers in the principal cities to the effect that 1000 men, representing skilled handicrafts as well as day laborers, could find employment in the district at remunerative wages. If this army should descend upon us in one body it would, to say the least, be embarrassing. But coming in platoons, detachments, companies, and even as regiments, we could place each body as it arrived and be ready for its successor. The scarcity of labor is not confined to any one particular line. In the past week the Dimmick Pipe Works received from an Eastern point 30 skilled mechanics that they tried in vain to obtain here. Other interests have their agents in the field trying without much success to supply their wants in this line. The improvements under way and in contemplation are of sufficient magnitude to employ a small army.

The Commercial Club has taken up the matter and will give official sanction to the plan. No sooner is one improvement completed than another stands ready to employ the labor that has been used.

The bank clearings indicate an improvement in general business largely in excess of a year ago. Numbers of enterprises are being considered that are delayed because of the uncertainty of securing the necessary labor to insure their successful conduct.

(By Telegraph.)

BIRMINGHAM, ALA., July 19, 1905.—The market is decidedly better. A continuance of good buying is noted and there has been an advance in price. Quotations are on the basis of \$11.50 for No. 2 Foundry, with an inclination on the part of some holders to wait for a \$12 market before selling more. It is a fact that analysis Iron sold yesterday, but only moderately, at \$12, for August and September delivery, and No. 2 Foundry sold at \$12, for last quarter delivery. As a rule sellers are confining sales as much as they can to delivery within 90 days. Some No. 1 Soft sold at \$12.50 for delivery in the last quarter. It is current and true gossip that the purchases of the leading buyer heretofore mentioned aggregate approximately 35,000 tons. The buying is general and the indications for a further advance are strong. The market is now approximately \$1 per ton above the lowest quotation made on the recent decline.

Cincinnati.

FIFTH AND MAIN STS., July 19, 1905.—(By Telegraph.)

Pig Iron.—The complexion of the market has undergone a radical change since our last report. At that time all that seemed necessary to start a buying movement was for several of the heavier consumers to come forward, which it was anticipated would have had the effect of injecting stability into what otherwise would be considered a very unsettled condition of affairs. This prediction has now become an actual fact, and it is believed that the minimum price has been reached and that the market is again on the upward grade. The turning point appears to have been reached at \$10.75, Birmingham, for No. 2, at which time several large inquiries developed that resulted in sales of considerable tonnage at or below this figure. A large melter in southern Ohio bought 4500 tons of both Northern and Southern brands, paying for the Northern portion a shade below established quotations. The report is that a number of buyers indicate a willingness to contract beyond January next, but there seems to be little disposition on the part of the furnaces generally to do this; consequently what sales have been made do not extend beyond this period. There are any number of inquiries in lots from 100 to 1000 tons, that in the aggregate represent a very large tonnage. Sales made during the week, covering large and small lots, will probably amount to 50,000 tons and were well scattered throughout this territory. One of the Pipe companies is said to have bought a large block, possibly aggregating 35,000 tons, a large percentage of which was for delivery to its Southern shops. The lower grades do not appear to have responded in the same degree as the higher, and at the present they are in light demand, with considerable stock on hand. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$14.25 to \$14.75
Southern Coke, No. 2.....	13.75 to 14.25
Southern Coke, No. 3.....	13.25 to 13.75
Southern Coke, No. 4.....	12.75 to 13.25
Southern Coke, No. 1 Soft.....	14.25 to 14.75
Southern Coke, No. 2 Soft.....	13.75 to 14.25
Southern Coke, Gray Forge.....	12.25 to 12.50
Southern Coke, Mottled.....	12.00 to 12.25
Ohio Silvery, No. 1.....	19.00 to 19.25
Lake Superior Coke, No. 1.....	15.65 to 15.90
Lake Superior Coke, No. 2.....	15.15 to 15.40
Lake Superior Coke, No. 3.....	14.65 to 14.90

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....\$18.00 to \$18.25
Lake Superior Car Wheel and Malleable 17.75 to 18.00

Instructions have been received by several local sales agencies to advance Southern No. 2 to \$11.50, Birmingham, basis.

Coke.—The market presents a more active appearance, and the situation is regarded as some stronger than a week since. A slight increase in contracts for the coming quarter is reported and much better feeling is said to exist. Prices are about the same. We quote the best grades of Connellsville Foundry from \$2.35 to \$2.65, f.o.b. ovens.

Plates and Bars.—No new developments are reported in this line, the demand for Structural Steel being very active. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in smaller lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—The market continues to be rather weak, and while dealers have considerable stock on hand they are unable to dispose of it to any great degree. Prices are unchanged so far as we can learn. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$13 to \$14 per net ton; No. 1 Cast Scrap, \$10 to \$10.50 per net ton; Iron Rails, \$16 per gross ton; Steel Rails, rolling mill lengths, \$12 per gross ton; Relaying Rails, 56-lb. and upward, \$21 per gross ton; Iron Axles, \$18 to \$18.50 per net ton; Car Wheels, \$14 to \$15 per gross ton; Heavy Melting Scrap, \$11 per gross ton; Low Phosphorus Scrap, \$14 to \$14.50 per gross ton.

New York.

NEW YORK, July 19, 1905.

Pig Iron.—Consumers in this district have taken a fair amount of Iron in lots running up to 500 tons, and considerable quantities have been purchased in this territory and in eastern Pennsylvania, the aggregate sales of Forge Iron having been quite heavy for delivery during the next quarter. Some round sales of Basic, aggregating about 15,000 tons, have also been effected. There is quite a good deal of Iron available still, and unless the buying movement is well supported by the general foundry trade any notable rise in prices seems hardly justified. Southern sellers have withdrawn the lower prices and are now asking \$11.50 for No. 2 Foundry Iron, Birmingham. We quote for Northern Irons, at tidewater, \$16.25 to \$16.75 for No. 1 Foundry, \$15.50 to \$16 for No. 2 Foundry, \$15 to \$15.25 for No. 2 Plain and \$14.50 to \$14.75 for Gray Forge. Southern Iron is selling on the basis of \$15 to \$15.50 for No. 2 Foundry, New York.

Cast Iron Pipe.—Outside of the New York City contract for 3000 tons, for which bids are opened to-day, little new business has come up. The city purchase will be made by the contractor to whom the award is made for laying the Pipe. A feature of Cast Iron Pipe business for some months is that 12-inch sizes have been the leading factor. It is believed that the buying of moderate sizes is for extensions of water service to outlying districts of cities and towns, the laying of large mains being of smaller proportions relatively than usual. We continue to quote carload lots at \$27 per net ton for 6-inch Pipe, at tidewater, with the market easy.

Finished Iron and Steel.—The structural trade continues to lead markedly in activity. The American Bridge Company took the contract in the past week for the new Poughkeepsie bridge for the New York, New Haven & Hartford Railroad. About 15,000 tons of material will be required, and work begins at once. Apart from this the week has brought out no important business, though a great deal is being figured on. The difficulty of obtaining material is a decided handicap upon the operations of bridge companies, particularly the leading interest. It is at present operating about 65 per cent. of its capacity single turn. It could run full capacity and at some shops double turn if deliveries could be made by the structural mills. The manufacturers of Steel Plates and of Structural Steel had a meeting in Jersey City on Tuesday, and it is understood that no change in prices was seriously considered. One or two cases in which producers of Plates had not observed the ethics of the trade are understood to have required some attention. The Plate mills still find a more active demand for light Plates than for heavy. Deliveries on the former cannot be made short of two or three weeks. On Heavy Plates deliveries within a week are possible. A little more inquiry for Plates for export has appeared. In Bars the week has been quiet, but full prices are obtained on all current business. We make the following quotations at tidewater:

Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04½c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.59½c. to 1.64½c.; Soft Steel Bars, 1.64½c.

Old Material.—There is a firmer feeling in a number of lines, in sympathy with the movement in Pig Iron, though buyers do not seem quite ready to take hold. The interruption of operations at mills in the early part of the month has added somewhat to the accumulation of Old Material. Foundry buyers are making some inquiries and dealers generally look for an increase in activity in the coming month. Meantime those who must make a quick turn on Material are naming figures that will bring business. Prices per gross ton, New York and vicinity, are represented by the following:

Old Iron Rails.....	\$15.50 to \$16.50
Old Steel Rails, rerolling lengths.....	13.25 to 14.25
Old Steel Rails, short pieces.....	13.00 to 14.00
Relaying Rails.....	19.50 to 20.50
Old Car Wheels.....	15.00 to 16.00
Old Iron Car Axles.....	18.00 to 19.00
Old Steel Car Axles.....	16.00 to 17.00
Heavy Melting Steel Scrap.....	13.00 to 14.00
No. 1 Railroad Wrought Scrap.....	14.50 to 15.50
No. 1 Yard Wrought Scrap.....	13.00 to 14.00
Iron Track Scrap.....	12.50 to 13.50
Wrought Pipe.....	11.00 to 12.00
Ordinary Light Iron.....	7.50 to 8.50
Cast Borings.....	6.50 to 7.50
Wrought Turnings.....	10.00 to 11.00
No. 1 Machinery Cast.....	13.50 to 14.50
Stove Plate.....	10.00 to 11.00

Metal Market.

NEW YORK, July 19, 1905.

Pig Tin.—The market was again higher in London, the last advance being caused by a report that the monthly Billiton sale was reduced from about 250 to 125 tons. This report has not as yet been officially confirmed. Another point of strength is found in Powell's returns of the shipment of the Straits Tin for the first half of July, which amounts to 2043 tons, as against 2286 tons in the corresponding period last year. The market here did not show the same strength as in London, although on July 13 and 14 a fair amount of business was done, and sales were made as high as 31.65c. on Friday, but on Monday and Tuesday the market not only eased off in price, but business was considerably lessened. The arrivals of late have been very heavy, amounting to 2310 tons, and many holders of the metal seem ready to profit from the advance. From the known movements of the metal it is thought the total arrivals this month may reach between 3500 and 4000 tons, as there are afloat for American ports 2603 tons. The firm undertone to the market is shown by the fact that the highest prices of the year were equalled on the London Exchange to-day, when £145 was quoted for spot delivery. This high price was also touched during the corner when spot was sold at £145; but then future sales were offered several pounds lower, while futures at the present time are quoted at £143 15s. The closing quotations on the local exchange to-day are 31.45c. to 31.60c. for spot, 31.37½c. to 31.60c. for July and 31.25c. to 31.50c. for August. Sales were made, however, at higher figures.

Copper.—There has not been so much activity in the Copper market the last week, but still business was of fair proportions and sales were made for deliveries well into the third quarter and some as far away as the beginning of the fourth quarter. Prices have not changed materially, although quotations on the Metal Exchange are from 15c. to 15.12½c. for both Lake and Electrolytic grades, and 14.75c. for Casting grades. Sales have been made at both extreme figures, varying according to the time of delivery and brand of the metal. Complete returns are now available for the exports of Copper during June, and C. Mayer, secretary of the New York Metal Exchange, gives the total exports from the United States for the month of June as 22,096 tons. The total since January 1, 1905, is 129,801 tons, against 114,044 tons in the corresponding period of last year. Business abroad has been much more active, the total sales in London yesterday being 1200 tons, of which 500 tons were of spot stocks. The total exports so far this month amount to 9838 tons. Prices have advanced in London to £67 6s. 3d. for spot, £67 12s. 6d. for future, and Best Selected is held at £71 15s.

Pig Lead.—The local market is steady at 4.55c. to 4.60c., and in St. Louis the same condition of affairs prevails at 4.50c. The American Smelting & Refining Company, however, continue to quote 4.50c. for shipment Lead in 50-ton lots. Reports from St. Louis show that the receipts there since January 1 amount to 1,209,435 Pigs, against 1,165,715 Pigs in the corresponding period last year. The shipments in the same period aggregate 768,240 Pigs, against 731,390 Pigs in the corresponding period last year. In London the metal is very strong, having steadily advanced for

the last month, and members of the trade conversant with the situation there complain of the scarcity of spot stock. The fact that there is no outside speculation in that market also tends to strengthen the position of the metal, which is now held at £13 15s.

Spelter.—The market is strong and has advanced both in St. Louis and New York. Locally 5.40c. to 5.45c. is asked for spot and 5.35c. to 5.45c. for deliveries during July and August. In St. Louis 5.25c. is the ruling quotation. At these figures there is said to be a good business, with very little metal for sale for future delivery. The price of Ore has also advanced about \$1.50 a ton.

Antimony.—The quotations for Cookson's and Hallett's remains unchanged at 13c. to 14c. Other grades are nominally held at 12c. to 13c. The market is still very quiet and consumers are buying only as they are compelled to.

Quicksilver.—In spite of the recent advance there is a fair amount of business now going on at the ruling quotation of \$40.50 per flask of 75 lbs. in 100-flask lots. In London Rothschild and second-hands are selling at unchanged figures of £7 7s. 6d.

Nickel.—The market remains unchanged, and the ruling quotation is 40c. to 45c. for large lots. Business continues of fair proportions, and stocks are of good size.

Tin Plates.—A fair amount of business is being done by jobbers in Terne Plates, and Coke Plates are also coming in to better demand. The quotation is unchanged at \$3.74 per box of 100-lb. I. C. Coke Plates, f.o.b. New York, or \$3.55, f.o.b. Pittsburgh. In Swansea Plates have advanced 1½ pence, to 11 shillings 7½ pence, in spite of the fact that the stock of Plates held there on July 1 was 231,618 boxes, against a stock of 127,618 boxes at the same time last year.

Iron and Industrial Stocks

NEW YORK, July 19, 1905.

The stock market has been quiet throughout the past week and the volume of business has shrunk to much smaller proportions than in the preceding week. Trading in the iron and steel stocks has been light, in common with that in other industrial shares and in standard railroad stocks. The feeling has been optimistic, however, and while there has been no notable advance, at the same time there has been practically no recession. The stocks of the United States Steel Corporation showed very small fluctuation in the week, the lowest price for the common stock being 33½ on Friday and the highest 34½ on Thursday, while 34½ was reached on Tuesday of this week. In the preferred the range has been from 101¼ to 102¾, which was reached on Tuesday. The lowest and highest prices on other stocks in the week ending Tuesday are as follows: Car and Foundry, common, 35¾ and 36¾; Locomotive, common, 48 and 49½; Colorado Fuel & Iron, 45¾ and 47¾; Pressed Steel, common, 40 and 40½; Railway Spring, common, 35¾ and 36¾; Republic, common 19¾ and 20¾, preferred 81 and 82½; Sloss-Sheffield, common, 82 and 83; Tennessee Coal, 84¾ and 89. This last was the widest fluctuation in any of the steel stocks, the high point being touched on Thursday. Last transactions up to 1.30 p.m. to-day were made at the following prices: Can, common 11½, preferred 68; Car & Foundry, common 36¾, preferred 99¼; Locomotive, common 48½, preferred 111¾; Steel Foundries, common 9, preferred 38; Colorado Fuel, 46; Pressed Steel, common 40, preferred 94¾; Railway Spring, common 36, preferred 99; Republic, common 20¼, preferred 82; Sloss-Sheffield, common 82½, preferred 107; Tennessee Coal, 86¾; United States Steel, common 34¼, preferred 102¾, new 5's 94¾.

At a meeting of the Pittsburgh Coal Company and the Monongahela River Consolidated Coal & Coke Company, held at Pittsburgh July 18, it was unanimously decided to pass the quarterly dividend.

Dividends.—Collins Company, Hartford, Conn., July 5 declared the regular semiannual dividend of 3 per cent. on the \$1,000,000 capital stock, and at the same time an extra dividend for the year of 2 per cent., both payable July 15. This makes the total amount distributed in dividends for the late fiscal year 8 per cent. The company, incorporated in the sixties, manufactures axes, &c. The annual dividend rate has been 6 per cent. for the past 20 years.

Crocker-Wheeler Company, Ampere, N. J., has declared the regular quarterly dividend of 1½ per cent.

National Fire Proofing Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable July 25.

The International Steam Pump Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable August 1. Books close July 20 and reopen August 2.

The Bethlehem Steel Corporation, successor of the United States Shipbuilding Company, has declared an initial quarterly dividend of 1¼ per cent. on the \$15,000,000 of preferred stock, payable August 1. Transfer books close July 26.

The Machinery Trade.

NEW YORK, July 19, 1905.

With a majority of machine tool manufacturers and dealers in this city the month of June was productive of the largest business for any one month in the past two years and with one very important company the greatest for any similar period in its history. Plants are now busy getting the orders out. As is natural, the hot weather has caused a slight depression and orders have fallen off to some extent since July 1. There have, however, been so many important machine tool lists submitted for bids that business keeps up at a fairly good pace. During the week the Norfolk & Western Railroad placed more orders for machines for its Bluefield shops and the Pennsylvania Railroad also did considerable buying. Outside of the machine tool lists the inquiries have slackened up to some extent and orders for small lots are not quite as numerous. Reports from Pittsburgh are to the effect that the machinery business in that section is quite good, while in the Chicago territory trade is said to have fallen off considerably.

Railroad Lists and Improvements.

The railroad lists before the trade were increased this week by the receipt of a machine tool list from the Delaware, Lackawanna & Western Railroad covering a miscellaneous lot of tools which are destined for the shops at Buffalo, N. Y., and Scranton, Pa. The list of tools was sent out for preliminary estimate only and it is thought that either a new list will be sent out later on covering the same tools or machine tool houses will be requested to submit additional bids before the railroad company takes up the question of purchase. The estimates will be submitted to President Truesdale, and after his approval an appropriation will have to be made before the machines can be purchased. The specifications, which were sent to only a few of the houses, call for machinery amounting to between \$20,000 and \$30,000.

The following list of tools for which the Pennsylvania Railroad Company, through the purchasing agent, is making inquiries is the last installment of the United Railroads of New Jersey Division, and practically ends the annual programme for this year. The programme, which has been spread through the last several months, has now been generally covered by orders which have been placed with the various manufacturers. The present list will doubtless be settled within a short time after quotations have been received: One punch and shear, hand power; one milling machine, horizontal plain, belt driven; one sheet metal former, hand power, 6-inch roll; one pipe cutting and threading machine, belt driven; one grinding machine, belt driven; one shaper, 17-inch stroke, belt driven; one metal working lathe, 12-inch swing over ways; one metal working lathe, 14-inch swing over ways; one metal planing machine, 66 x 66 inches; one metal planing machine, 30 x 30 inches, and one car wheel boring machine, motor driven.

The list sent out last week by the Brooklyn Rapid Transit Company covers about \$20,000 worth of machine tools. As noted in these columns last week, this machinery is for the equipment of the new East New York shops at Fulton street, Jamaica avenue and Broadway, Brooklyn, where the company expects to spend \$1,000,000 for various improvements. It is understood that John G. Walker, who has the matter in charge, has placed orders for a few of the tools.

The other list of machine tools sent out last week by the St. Louis & Iron Mountain Railroad through Westinghouse, Church, Kerr & Co., New York, calls for various machines aggregating in value a little over \$20,000. This machinery is required for equipping the company's new machine shops at Baring Cross, Ark., and is the second list sent out by the company within the last two or three months. The first machine tool list sent out by the company included the equipment for its new boiler shops, aggregating in value about \$20,000. This list was closed about six weeks ago, the bulk of the orders having been secured by Manning, Maxwell & Moore, New York.

The Intercolonial Railroad of Canada, which has for some time had under consideration the construction of new machine shops at Moncton, N. B., has set aside about \$1,500,000 for various improvements to its system, part of which amount, it is understood, is to be used in making improvements at Moncton. Of this amount of money about \$57,500 is to be used for construction of machine shops and engine houses, \$150,000 for bridges, \$850,000 for rolling stock and the balance for various other improvements at important points.

Extensive additions are to be made to the El Paso, Texas, shops of the El Paso & South Western Railroad, according to an announcement made by a representative of the Phelps-Dodge Company, 99 John street, New York, which firm is largely interested in the railroad. The plans include a machine shop, 137 x 323 feet; a 20-stall roundhouse, coach and repair shop, 80 x 100 feet; power house, 50 x 100 feet;

toolhouse, oil storage tanks, lumber yards, coal chutes and conveying machinery water tanks and office building. Considerable grading will have to be done to prepare the site for the buildings and the company has been spending considerable money for excavating machinery and the like. J. L. Campbell, engineer of maintenance of way of the El Paso & South Western Railroad, who has offices at El Paso, has charge of the preliminary work of preparing for the erection of the structures and planning them and it is thought that all the buying will be done at that city. The question of building the machine shop and other structures has been discussed among the railroad officials for some time and it has been conceded that the improvements were badly needed. It is expected that before long additional buildings will be erected, as it is understood that the company expects to locate its principal repair and construction shops at that point.

Other Machinery Notes.

The Niles-Bement-Pond Company, New York, in addition to a large share of the Erie orders, secured a good slice of the orders placed by the Norfolk & Western Railroad. Business of the company for the month of June was the largest of any single month in its history, and all of its plants are at the present time running full.

The Railway Steel Spring Company, 71 Broadway, New York, has closed a contract with the Archbold-Brady Company of Syracuse, N. Y., for furnishing the steel work for the construction of a large foundry building, 90 x 130 feet, to be added to its plant at Syracuse. The machinery equipment in the old structure, which will be used for other purposes, will be moved into the new one, but as the latter will be much larger than the existing foundry considerable new equipment will have to be added. The company is now buying machinery for the foundry through its New York office and the details are in the hands of the engineering department.

The Rust Boiler Company, Pittsburgh, has received an order for three 500 horse-power boilers, to be installed in the boiler plant at the National works of the National Tube Company, McKeesport, Pa. Contracts for cranes, shears and other equipment to be installed in this plant will be placed in a short time.

The plant of the Damascus Brake Beam Company, Sharon, Pa., burned recently, will be rebuilt, and considerable new equipment will be needed.

At the recent annual meeting of the Ridgway Machine Tool Company, Ridgway, Pa., the following officers and directors were elected: Harry R. Hyde, president; Perry R. Smith, vice-president; Wm. Noyes, secretary; E. C. Powell, treasurer; L. H. Morgan, superintendent and general manager; H. S. Thayer, J. K. Gardner, R. J. Powell. The company has plenty of work on hand and has appointed a committee to consider the question of increasing the capital stock. Several machines have been turned out that are doing good work and others are nearly finished.

The Interborough Rapid Transit Company has taken steps toward ventilating the Subway by having large electric fans placed at the Brooklyn Bridge station and other points along the line to draw out the impure and warm air. Two large rotary fans have been placed at the entrance of the Brooklyn Bridge and another large blower has been installed north of the Fourteenth street station. It has been stated by the engineers in charge of the problem that other fans will be purchased to give temporary relief. A new ventilating shaft will be opened at Seventy-second street and other ventilating shafts will be opened at various points. These arrangements are only temporary, however, and it is expected that more fans will be purchased and later on a permanent method of relieving the atmospheric conditions in the Subway will be devised.

Announcement has been made of the plans of the Brooklyn Water Department for the expenditure of \$3,390,000 allowed by the Board of Estimate of New York for the improvement of Brooklyn's water supply, and the plans for the expenditure of the money show that considerable of it will be spent for machinery. The conduits from Massapequa to the Ridgewood reservoir will be reconstructed at an estimated cost of \$2,750,000, and the old brick conduits will be replaced by 60-inch steel pipe. The Ridgewood and Mt. Pleasant engine houses will be remodeled, and it is thought that the amounts spent at those places will be \$650,000, and \$200,000 will be spent for an extension to the distributing system. The reconstruction of the engine houses will entail a considerable expenditure for power machinery, and some pumping machinery will be bought.

Large Hydraulic Power Plant.

More than \$12,000,000 will be spent by the Rio de Janeiro Tramway Light & Power Company, 25 Broad street, New York, in the city after which the company is named. It is expected that the company will purchase a large list of machinery for a hydraulic and generating plant, transmission line, substations, distributing system, cars and railway. It is understood that all the contracts for the construction of the buildings and their equipment will be closed in New York, and the machinery trade here can look for something

large in the way of machinery lists when the plans are completed. The company has for some time past been a heavy buyer in the New York machinery market, and contracts have been closed for three 600-kw. generators for a temporary plant to be erected at the scene of the construction, and the contract for a steel building to inclose the plant will shortly be awarded. While plans for the improvements to be made have not been completed as yet their cost has been roughly estimated. It is calculated that the hydraulic and generating plant will cost \$3,120,000 and the transmission line \$1,325,000. About \$810,000 will be spent on substations, and it is estimated that the distributing system will cost \$2,200,000. There will be 125 miles of railway, 294 cars will be purchased and \$300,000 will be spent for additions to gas works, while a temporary steam plant will be built at an estimated cost of \$250,000. The company owns water power rights which it is calculated will produce 100,000 horse-power, and at present 50,000 horse-power will be developed. The water power is about 75 miles from Rio de Janeiro. The contemplated expenditure provided for now is by no means the full total of the money to be spent by the company, as it is expected that the plants for which plans are being prepared will be enlarged in the near future.

Business Changes.

Walter A. Darling, for many years connected with cutter department of the Brown & Sharpe Mfg. Company, Providence, R. I., has been appointed manager of the New York store of the Union Twist Drill Company, whose headquarters are at Athol, Mass.

The Morgan Engineering Company, Alliance, Ohio, has opened a Chicago office at Room 755 Railway Exchange, which is under the management of Frank J. Ruth.

New England Machinery Market.

WORCESTER, MASS., July 18, 1905.

Contrary to general expectations and in spite of the extreme hot weather which has prevailed over much of the manufacturing section of the country many of the machine tool manufacturers of New England are finding business actually improving as compared, not with the past few weeks, but with the best of the ordinary run of business in the spring. This may not be the universal experience, but it is certainly true in a considerable number of instances among what may be termed representative establishments in the various lines of machine tool manufacture. Foreign business has been gradually bettering, but the bulk of the improvement comes from American customers. The machinery dealers of Boston and other New England cities do not feel this as much as the manufacturers, for the local demand is not so great as it is from other sections. Yet it is by no means poor locally, according to the reports of most of the dealers.

A direct result of the consolidation of textile machinery interests of New England, which has been noted in this column, is the organization of an independent company at Lowell, Mass., headed by Frederick P. Shaw of that city, until recently with the Lowell Machine Shops, which is one of the companies in the merger. It is a Maine corporation, with authorized capital stock of \$300,000, and the officers are: President, Frederick P. Shaw, Lowell; treasurer, John C. Burke, Lowell; assistant secretary and treasurer, Ralph O. Ingram, Lawrence, Mass. Charles L. Hildreth, for many years superintendent of the Lowell Machine Shops, is associated with the new company as a director. Walter A. Scott, formerly foreman of the worsted department of the Lowell Machine Shops, will be the superintendent of the new company's shops. The company will specialize on worsted machinery. A tract of land has been secured at Lowell upon which will be erected a modern machine shop and foundry, and it is planned to have the plant running in four months. Already orders have been placed for most of the machine tools which will be needed. Most of the men connected with the management were formerly with the companies now merged under one ownership.

A. L. Lovejoy, general manager of the Becker-Brainard Milling Machine Company, Hyde Park, Mass., sailed Tuesday on the Saxonia from Boston for a two months' trip in England and on the Continent. Mr. Lovejoy goes on business and will visit the important machinery centers during his absence.

The new shop of the Norton Grinding Company, Worcester, Mass., or, rather, the extension of the present shop, is practically completed, and the work of rearranging the machine equipment has begun. The new tools will consist of a Jones & Lamson flat turret chucking lathe, Pratt & Whitney 3-inch turret lathe, No. 2 Lucas boring and milling machine, Becker-Brainard vertical milling machine, Hendey-Norton centering machine and a few smaller tools. A 150-kw. Westinghouse engine and generator and a 200 horse-power Stewart boiler will be installed to provide power for the shop, which is now operated from the power plant of the Norton Emery Wheel Company. When

the power plant is completed, to provide electric power for running the Norton Grinding Company's tools, the entire machine business of the Norton Emery Wheel Company will be transferred to the Grinding Company's shop, to be manufactured under contract. This includes the universal as well as the plain grinders of the Emery Wheel Company. The Norton Grinding Company's shop is practically doubled by its extension. A system of cranes covers nearly the whole area, including the galleries of the new section, which for most of the 120 feet of new length are extended out nearly the entire width of the building, leaving a space only 18 feet wide for the passage of the crane hoist. The building is now 260 feet long and 80 feet wide. The company reports an increase in domestic demand for its heavy cylinder grinding machines.

The development of New England's water power is proceeding with always increasing rapidity, and the prophecy is made that another generation will see practically every important privilege not already occupied by manufacturing establishments harnessed to produce electric energy. Many plans are on foot to develop comparatively small privileges from 300 horse-power upward. The electric railways and electric companies which sell power for lighting and power are eagerly scanning available privileges, and there are many such in hilly New England and generally within easy access of the point of consumption. Manufacturing establishments which have had to eke out their water power by the use of steam, even at times of plentiful water, are going some distance from their plants and developing water privileges which have been in disuse for years or which have never been used at all. Large companies are forming to develop power on a large scale all over the six States, possibly excepting Rhode Island, which has few privileges of large power. The demand for turbine wheels, penstocks, electrical generators and other equipment will be very large during the next few years and dealers are keenly alive to the fact. The manufacturers of steam engines and boilers are also much interested in this development, for New England streams have frequent periods of low water, and where new water power is developed sooner or later steam must be installed as an auxiliary power, else there will be times when the consumers of the hydro-electric power will be forced to shut down.

The J. Stevens Arms & Tool Company, Chicopee Falls, Mass., is planning to install a new water power plant to generate from 300 to 500 horse-power. Water turbines and electric generators will have to be purchased if the plan goes through, and this is contingent upon permission from the city of Chicopee, because the plan includes the raising of a reservoir which would mean changing the location of a highway. It is stated at Chicopee that the necessary permission will undoubtedly be given. The company estimates that the cost of power will be very materially decreased by developing the water power. The present cost is about \$40 per horse-power, using coal, which is expensive because of the high freight rates. It is stated that the cost of maintaining the water power plant will not be more than \$10 per horse-power.

George B. Haskell and A. P. Webster, Lewiston, Me., have purchased water rights on the Androscoggin River at South Paris, Me., and propose to develop the power for electrical purposes. They state that their plans are not yet definitely decided.

The Uncas Power Company, Norwich, Conn., has been incorporated in Connecticut with a capital stock of \$50,000, with the right to increase to \$1,000,000. New power plants will be established, employing both steam and water to generate electric energy. The company is specifically authorized to furnish power to the Groton & Stonington Street Railway and the Norwich, Mystic & Westerly Street Railway. The incorporators are Edwin W. Higgins, Charles W. Comstock and Costello Lippitt, all of Norwich, where the office of the company will be located.

The St. Johnsbury Electric Company, St. Johnsbury, Vt., has purchased the E. T. & H. Ide water power at Passumpsic, Vt., and will establish a third electric power plant there to develop 400 horse-power. Work will begin immediately. The power will be devoted to supplying the demands of St. Johnsbury.

The Builders Iron Foundry, Providence, R. I., has been awarded the contract for a 5,000,000 gallon d'Auria pumping engine for the city of Woonsocket, R. I. The engine will be of the horizontal tandem duplex high duty type and will pump against a water pressure of 100 pounds with a steam pressure of 165 pounds.

The A. C. Lawrence Leather Company, Boston, is to erect a large addition to its tannery at Peabody, Mass. The new building will be 70x210 feet and six stories. Six new boilers will be installed.

G. D. Mitchell, formerly of the United Shoe Machinery Company, but better known as the Jones & Lamson expert, with which firm he has been connected for the past five years, has just become associated with the Warner & Swasey Company, Cleveland, Ohio, in the capacity of Western representative.

Cleveland Machinery Market.

CLEVELAND, OHIO, July 18, 1905.

A spell of extremely hot weather does not seem to have put a damper upon the machinery business; rather it has accelerated it. Dealers who have complained all spring about spasmodic business now say that it is coming along in good volume and that inquiries are more encouraging than they have been for a long time. Quite a number of manufacturers claim to be busier than ever before. One prominent maker of machine tools reports that in anticipation of the usual hot weather depression he had taken a large order for machinery at slightly shaded prices with a view to keeping his plant going all summer on full time. Now he wishes he had not taken the order, for the regular business is heavier than it has been in months back and prices are inclined to stiffen rather than otherwise. The automobile game continues to occupy the center of the stage for many of the local dealers and makers. The automobile people are closing the most prosperous season on record, and almost without exception they have been totally unable to take care of all the business offered them or get out cars early enough for anxious agents and customers. Almost every manufacturer is planning to increase his output for next season, and from all over this district the machinery people are getting inquiries and orders for additional tools, and in a number of cases new concerns are going into the business. Work on 1906 product will be started about September 1 by the majority of makers, and some of them have already started. The plan of waiting until after the big national automobile shows held during January before deciding on new models has been wholly abandoned.

The Garford Company, one of the largest makers of automobile material and parts, has announced a new policy in line with facilitating production. Heretofore it has manufactured to order almost anything that a manufacturer desired. Engines and parts of all kinds differing from one another only in a few details and measurements have been furnished according to specifications. For the coming season this company will make only a few high class standard lines and according to its own specifications, and while it will have various varieties of parts to answer different requirements, the "built to order" feature will be eliminated. This will obviate one of the greatest sources of delays heretofore met with in the production of automobiles, and it is believed that other large material makers will follow suit.

George H. Bowler, a well-known machinery dealer, is obtaining figures on a large list of automobile machinery, which, he says, will make up one of the largest and most complete plants in the country. He declines at this time to mention his principal, but it is understood that it is a local concern already established in a small way.

The Hoffman Hinge & Foundry Company, which heretofore has made a specialty of automobile castings, has established a machine department and is erecting a building, 60 x 150 feet, which it is fitting with special automobile machinery. In all it will have about 1500 square feet in this department. It is not the intention to manufacture complete automobiles, but it will do special jobbing work, building complete engines and other parts according to the specifications of manufacturers. In connection with its foundry department the company will be able to furnish a wide range of automobile material.

The Royal Motor Car Company, which heretofore has been in the business on a comparatively small scale, is preparing to make important additions to its buildings and shop equipments. It will build several hundred large high-priced touring cars next season.

Foot, Burt & Co., manufacturers of multiple spindle drills, have been furnishing a number of their tools to automobile makers and have many inquiries from this class of trade. The company also reports that the demand for large railroad tools is heavier than ever before. It is shipping a large mud ring and flue sheet drill to the Union Pacific, another to the Chicago & Great Western and another to the Grand Rapids & Indiana, and a large multiple drill to the Canadian Pacific. Last week it shipped four very large multiple drills to Berlin. It is about two months behind on all classes of tools.

The Ajax Mfg. Company, manufacturer of forging and upsetting machinery, is experiencing the heaviest business in its history. It is getting an especially large amount of business from foreign countries. Recently it shipped four 60,000-pound forging machines to South America. Two large machines were shipped almost simultaneously last week, one of them going to a Japanese navy yard and another to a Russian navy yard. It recently shipped a 6-inch upsetting machine, the largest it turns out, to the Pullman Car Company, Chicago. R. H. Pratt of this company is now on a trip abroad, his business being principally with Charles Churchill & Co., London, who are agents for the Ajax Company.

E. Vaghi of Milan, Italy, is expected to call on some of the machine tool makers here soon. He is buying special automobile machinery for a plant at Milan and is also in-

specting cotton spinning machinery. This week he is at the Grand Hotel, Cincinnati.

The Van Dorn Iron Works Company, East Madison avenue, is erecting a factory addition, 120 x 280 feet, brick and steel construction. Some new machinery will be installed.

The American Stove Company will erect a new factory building at Lorain, Ohio. It will be a one-story structure, 81 x 153 feet. Kaltenbach & Griess, Cleveland, engineers, have the plans for building and equipment.

The Conway Stove & Range Company, Fremont, Ohio, has awarded the contract for the erection of a mammoth stove plant, which is to be completed October 1. The foundry will be 80 x 300 feet; warehouse, 88 x 300 feet; office, 45 x 60 feet, and stockroom, 45 x 150 feet. The plant will employ 300 men.

Municipal and Power Work.

After long deliberations over the respective advantages of gas and steam engines the Board of Public Service of Toledo has awarded a contract to the S. M. Jones Company, Toledo, for pumping machinery for the new water purification plant. The price was \$54,000 and the pumps will be operated by gas engines. The bid accepted includes a gas producer plant.

The Board of Public Service of Nelsonville, Ohio, will receive bids until July 24 for the installation of a complete municipal electric lighting plant, consisting of three 16 x 72 inch boilers, two engines, alternating current generators, boiler feed pumps, piping, wiring, 68 inclosed arc lamps, &c. Specifications were prepared by C. A. Poe & Bro., Pittsburgh, and proposal blanks may be secured from W. H. Parks, Nelsonville.

The Board of Public Service of Elyria, Ohio, will receive bids until July 31 for the furnishing and erection of one 125 horse-power Scotch boiler and one low service pump of 5,000,000 gallons capacity, bids to be received on both compound duplex and centrifugal pumps, with a direct connected compound vertical engine. Scott Hinman is Village Clerk and has specifications.

The Crawford Gas & Electric Company, recently formed at Galion, Ohio, is having plans prepared for a large power plant to cost about \$75,000.

The Parsons & Parsons Company, drug manufacturer, is having plans made for a power plant in connection with a new manufacturing plant which it is preparing to erect.

Cincinnati Machinery Market.

CINCINNATI, OHIO, July 18, 1905.

Trade in machine tools continues good, notwithstanding the fact that midsummer with its usual accompanying inactivity is upon us. The month of July thus far has shown quite a distinct falling off in orders as compared with the months preceding, but as a large percentage of the shops have contracts ahead far into the fall they are well satisfied with conditions as they exist. There is every indication that an immense trade will develop later in the season and the year, taken as a whole, will prove to have been one of the very best ever experienced. Foreign trade continues excellent, and this particular feature of the demand for machine tools bids fair to prove a record breaker. The automobile industries that have sprung up throughout the length and breadth of this land as well as in foreign fields have been the means of rapid growth along certain lines of tools and have been a very large factor in maintaining the high standard of trade as it exists to-day. As a rule when trade is a little quiet there is a disposition among builders of machine tools to get out new designs and make every effort possible to the end that their particular line of tools shall make a record for speed and efficiency. As at this particular time we hear very little of anything of this character we feel quite sure of the premises and are apparently justified in saying that the situation is well defined and has every sign of strength.

The J. A. Fay & Egan Company has its additional building up as far as the third floor, and, barring delays, will soon have the exterior completed. The month of June is said to have been the largest in volume of business handled in the history of the concern, and while foreign demand entered to a large extent in actual business done the most of it came from points in our own country.

The Bickford Drill & Tool Company reports an exceptionally heavy inquiry for this season of the year. It is experiencing considerable trouble in making deliveries, as contracts are coming in faster than were expected. Considerable railroad trade has recently developed that has been of especial interest and has been the means of causing it to run its shop to its full capacity and occasionally work overtime.

The Lodge & Shipley Machine Tool Company is no exception to the general rule and is comfortably taken care of in the way of business. Mr. Lodge is now in Boston, and while in that city will look after the interests of the Indus-

trial Bureau and interview one of the concerns relative to removing to this city.

The John Steptoe Shaper Company is now completing quite a number of tools for shipment abroad. These orders have been coming to it in lots of three and four machines, which, in connection with trade originating at home, has given it plenty to do. Prospects for fall trade are reported as exceptionally good.

The Cincinnati Milling Machine Company expresses itself as being more than satisfied with the outlook and is patiently waiting for its additional space that is now being prepared, so that it can more readily handle the immense trade that has been secured. The reputation of the tools made by this concern is second to none, and the success and rapid growth are the result of the class of tools that it manufactures.

Philadelphia Machinery Market.

PHILADELPHIA, PA., July 18, 1905.

The influence of the midsummer vacation period, together with extremely warm weather, is having a noticeable effect on the machinery trade in this territory. Such business as is transacted lacks the usual dash and swing, and delays both in placing business as well as making deliveries are not infrequent. The conditions, however, are not unusual and are not looked upon with any degree of apprehension. Many manufacturing plants were temporarily shut down during the early part of the month both for stock taking and for general repairs, and in many instances their future needs in the line of machinery and tools will not be decided upon until September. Owing to extreme weather at this time many manufacturers are unable to operate their plants to the full capacity and a number have as much as they can do to meet the demands made upon them for prompt shipment. The quiet condition of trade recently has been particularly noticeable to the machinery merchants, who report the last two weeks as extremely dull and in keeping with the season of the year. Railroad specifications are probably the most important inquiries which have been received, although here and there the sale of one or more large tools has aided materially in dispelling the inactivity of the season. General inquiries have fallen off to some extent; outside of railroad work but little of importance has come on the market; large specifications are almost entirely absent, while here and there prices are being requested for a few tools, mostly for minor extension and renewal. The demand for small tools and light machinery is weak, as is also that for some classes of second-hand tools and machinery. Opinions as to the duration of the present inactivity are varied; in some lines an active demand is not looked for much earlier than September, and in others it may be later than that; no doubt, however, exists as to the actual resumption of prosperous conditions, as all the elements entering into the making of good business in the future are comparatively strong.

The foreign demand remains practically unchanged. There is some good inquiry from time to time, but the bulk of the business is made up of more or less regular business in established standard lines and specialties.

The iron and steel foundries continue active. It is not possible at this season of the year to make as heavy an output of castings as at other times, owing to the excessive heat; many plants, however, have their books well filled with orders and are being pushed for deliveries; this is particularly noticeable in the steel casting field and with makers of high grade, special and charcoal iron castings. Many of the smaller gray iron foundries and jobbing foundries could take on considerable more business without straining the capacity for production.

The Penn Reduction Company, a new corporation of this city, which was awarded the contract for the disposition of the city's garbage during 1906, will erect two plants for the treatment of the garbage. Plans are being prepared for a plant at the Delaware and another on the Schuylkill River. Just what process will be used, or the requirements in the way of machinery or equipment, is not yet announced.

The Hoist Mfg. & Construction Company is busy on a varied line of hoisting machinery, among other orders being one for a 10-ton and one for a 5-ton electric traveling crane. This concern will in the near future place on the market a new chain block hoist which, it is said, will contain novel features.

The Link-Belt Engineering Company has a large amount of general work on hand. Inquiries keep up very satisfactorily and the estimating department finds difficulty in meeting the demand made upon it. There is considerable demand for cane, sugar and bagasse handling machinery for Cuban delivery, while the inquiry for coal handling and coal storage plants keeps up well. Recent orders include a 300-ton coal, sand and ashes station at Gray's Ferry, Philadelphia, for the Pennsylvania Railroad, and a retail coal pocket of 1000 tons capacity to be erected at the yard of C. J. Swarr & Co., Lancaster, Pa. Recent deliveries for export by the

Link-Belt Company include an extensive bagasse handling plant for parties in Cuba.

The American Pulley Company continues busy. There is a good demand for its wrought steel pulleys, particularly from the New England and the Middle States. Some good business has also been taken from the South and the West. Foreign demand is somewhat quiet, although shipments in fair quantities have been made to England and Australia. Carload lots of pulleys have also been shipped to parties in New England and the South.

The Philadelphia Roll & Machine Company has taken orders recently for a number of 8, 10 and 12 ton rolls, also for several large fly wheels weighing over 30 tons each. The demand for charcoal iron castings continues active and it is busy in all departments of the plant. Recent deliveries of both sand and chilled rolls have been made to many of the large iron and steel mills in this and the Middle Western territory.

Dienelt & Eisenhardt, Incorporated, keep continuously busy, having work enough on their books to keep their plant actively engaged for many months ahead. Additional orders for flanging machines, including one for the Mare Island Navy Yard, have been received, and a good demand for hydraulic jacks is noted from the various railroads. Business in electric motors and generators is improving steadily, among recent orders being one for a 25 horse-power motor and one for a 50 horse-power generator for local parties. The foundry department of their plant has a large amount of work on hand, and business generally is considered by them to be in very good condition.

Chicago Machinery Market.

CHICAGO, ILL., July 18, 1905.

Though business was rather quiet the past week, the undertone of the situation was strong and encouraging. The knowledge that bounteous crops in hay and small grains are being harvested throughout the West and that the corn crop is up to the present statistically encouraging is having a stimulating effect on the trade and leading already to rather better inquiry for machine tools than is expected at this time of year. Business being actually closed is light and of a miscellaneous pick up character. In a general way trade in wood working tools and machinery has been better than for iron working tools.

The Santa Fé road placed with Manning, Maxwell & Moore the bulk of its requirements for sheet metal working tools, details of which we printed in our issue of June 29. Several other tools have been placed during the past week by the same road, but the awards were of a scattering character.

The American Cereal Company has been a rather heavy buyer of machinery, presumably for rebuilding its plant at Cedar Rapids, Iowa. The Otis Elevator Company has bought liberally also.

The injunction against the city of Chicago to prevent its letting contracts on internally fired boilers has been made permanent and it will be necessary for the city to readvertise for bids without specifying any certain type of furnace or otherwise limiting its boiler bids to a few interests.

Mexican industrial affairs seem to be more than usually active and large quantities of machinery and tools, including engines and boilers, are being figured on for Mexico delivery.

The Greenville Gas & Gasoline Engine Company, Greenville, Mich., has organized and will erect a two-story plant, 35x210 feet in dimensions. Power for the plant has been provided for, but the company requires all machines and tools necessary for the manufacture of gas and gasoline engines. E. Rutan is president of the company.

Henry Orme's Sons, St. Paul, Minn., have purchased a 5-acre tract at Columbia Heights, Minn., and will at once erect a steel and iron foundry. The plant will be operated by electricity. No equipment has yet been purchased. F. J. W. Orme, secretary of the company, will remove to Minneapolis.

The General Electric Company, Schenectady and Chicago, has been awarded the contract by D. Aguirre & Co. of Tepic, Mexico, for the construction of a hydro-electric power plant of 1200 horse-power capacity near that city, which will cost more than \$100,000. The current will be utilized for lighting the city of Tepic and for supplying power to the Aguirre factories.

A new company has been formed at Creston, Iowa, to build an electric light plant. Equipment has not been ordered. J. W. Reynolds is secretary of the company.

The Armstrong Brothers Tool Company, Chicago, announces that it has moved to its new plant at 104-124 North Francisco Avenue.

The total number of railroad locomotives ordered in the United States for delivery in 1905 is now somewhat above 4000. For the entire year 1904 the total was 3441; for 1903, 5152, and for 1902, 4070. It is expected that this year's orders will exceed 4200.

Government Purchases.

WASHINGTON, D. C., July 18, 1905.

Motley, Green & Co., New York, have been awarded the contract by the Isthmian Canal Commission for two horizontal tubular boilers at their bid of \$713.90 for each boiler. Bids were opened June 21.

The Niles-Bement-Pond Company, New York, has practically been awarded the contract for the 15-ton traveling crane for the Norfolk Navy Yard at its bid of \$4685. Bids were opened July 1.

The following additional awards have been made for machine tools for the various navy yards, bids for which were opened June 27:

Smith-Courtney Company, Richmond, Va., class 71, one electric hoist, \$370.

Prentiss Tool & Supply Company, New York, class 91, one back geared crank shaper, \$550.

Becker-Brainard Milling Machine Company, Hyde Park, Mass., class 93, one universal milling machine, \$775.

Manning, Maxwell & Moore, New York, class 124, one horizontal plate bending roll, motor driven, \$1060.

Under bids opened June 20 for supplies for the various navy yards the following additional awards have been made:

Niles-Bement-Pond Company, New York, class 116, one motor driven vertical boring and drilling machine, \$333; class 128, one 36-inch triple geared engine lathe, belt driven, \$1510.

Hendey Machine Company, Torrington, Conn., class 127, one back geared engine lathe, \$875.

Oliver Machinery Company, Grand Rapids, Mich., class 141, one band sawing machine, electrically driven, \$665; class 142, one No. 1 scroll saw, electrically driven, \$240; class 146, one universal double arbor tilting table saw bench, \$660; class 160, one automatic band saw, six No. 0 wood trimmers and three No. 5 wood trimmers, \$577.

M. B. Tidey, Newark, N. J., class 143, one new pattern combination saw and dado machine, \$485.50; class 144, one cutting off saw machine, \$598.

The Morgan Spring Company Buys an Ohio Plant.

The Morgan Spring Company, Worcester, Mass., has purchased the valuable plant of the Youngstown Bolt Company, at Struthers, near Youngstown, Ohio, and will operate it as an important department of its manufacturing business. A rod mill, with an annual capacity of 45,000 tons, will be installed, the order for the mill having been placed with the Morgan Construction Company, Worcester, Mass. As the capacity will be in excess of the requirements of the Spring Company the surplus product will be placed on the market. It is announced that a connection is under consideration between the Morgan Spring Company and a large steel plant located near Youngstown, and this arrangement once made the company will be in practically as independent a position as if it were itself a producer of steel. Details of this portion of the plan are not yet ready for announcement.

The property at Struthers consists of 80 acres of land bordering on the Mahoning River, which is a part of the reported course of the ship canal that is projected to connect Pittsburgh with Lake Erie. There are five large buildings on the premises, all of modern construction and comparatively new, having been erected within three years. The property was purchased at public sale last week. The new rod mill is already under construction at the Worcester shops of the Morgan Construction Company, and it is expected that it will be in operation some time in the fall. The Youngstown property includes a merchant mill, but it is unlikely that it will be operated by its new owner, though definite plans have not been made. Neither is it determined what disposal will be made of the bolt machinery with which the plant is equipped.

No finished product will be manufactured at Youngstown by the Morgan Spring Company; at least such is the present intention. The works at Barbers Crossing, Worcester, are modern and well equipped to care for the manufacture of wire and springs and other specialties. It is probable that no wire will be drawn at Youngstown for the present, though the future may see the company continuing its growth in that department in its Western works, where coal and materials can be handled cheaper than at Worcester because of lower freight rates.

In connection with this extension of its manufacturing facilities the Morgan Spring Company, which is a Massachusetts corporation, has increased its capital stock from \$100,000 to \$900,000. Charles H. Morgan, president of the Morgan Construction Company, is president of the Spring Company, in which he holds a large interest, and Paul B. Morgan is treasurer of both corporations. The personnel of the Board of Directors has not been definitely decided, but Ohio men heavily interested in steel making and coal mines will be on the board. Frank F. Bullard, general manager of the Spring Company, will act in that capacity for both plants, with an assistant located at Youngstown. The headquarters of the company will be at Worcester.

OBITUARY.

FRANK W. PLAYSTED, ex-president of the Playsted Tool & Die Company, Milwaukee, died at Redlands, Cal., July 13, after an illness of over two months. Mr. Playsted was about 30 years of age and had lived at Milwaukee for four years. He established himself in business about a year ago, being associated with the Milwaukee Cutting Die Company.

JOHN J. DEEMER, a well-known retired steel manufacturer of Chester, Pa., died on Wednesday, July 12, at New Castle, Del., where he had been visiting. He was born near Coplay, Lehigh county, Pa., on December 15, 1836, and was employed by the Structural Iron Company of Philadelphia for a number of years. In 1876 he became general manager of the Chester Steel Casting Company, which position he held for years.

T. JACKSON SHAW, vice-president of the Harlan & Hollingsworth Company, Wilmington, Del., died on July 13, aged 52 years.

WILLIAM M. HORNE of the firm of Horne Brothers, dealers in iron and steel, Boston, Mass., died at Malden, Mass., July 17, aged 52 years. He was a native of Lowell, Mass. His entire business life was passed in the iron and steel trade. He formed the firm of W. M. Horne & Co., which later became Horne Brothers. He leaves a widow, a son and a daughter.

Independent Sheet and Tin Plate Manufacturers.

About a dozen of the independent sheet and tin plate mills were represented at a meeting at the Hotel Lincoln, Pittsburgh, Friday, July 14, called by W. A. Taylor of Niles, Ohio, who was secretary of the recent temporary organization. Before notice for the meeting was sent out sentiment had been sounded and proved to be generally favorable toward the formation of a permanent organization, but various mill representatives were prevented from attending, and it was concluded to postpone positive action. A committee was appointed, consisting of J. J. O'Connor, W. U. Follansbee and W. S. Horner, to keep the matter alive. The employment of a salaried secretary was discussed and appeared to be favored. The name of one gentleman was suggested, but it cannot be determined yet whether he will serve. Another meeting may be called in about a month. The main function of the organization will not be, as has been surmised in some quarters, to deal with labor, but rather to deal with manufacturers and avoid price cutting.

President Mellen of the New York, New Haven & Hartford Railroad has announced that the company plans to substitute the overhead trolley for the third rail system on its line connecting Hartford, New Britain and Bristol, Conn., over which there has been a great deal of contention owing to claims that the third-rail was a menace to life. The company had previously announced that it would return to a steam passenger service, which was strongly deprecated by the cities and towns affected. It is also proposed to equip the Highland Division, between Hartford and Rockville, with the overhead trolley system for suburban service.

Trade Publications.

Superheaters.—Power Specialty Company, 126 Liberty street, New York City. Catalogue. Third edition of catalogue on the subject of superheated steam. Gives a discussion of steam superheating and full description of the Foster patent superheater, showing the elements of its construction and combination of the parts in a separately fired superheater. Sectional views show different types of water tube and fire tube boilers with Foster superheaters installed. The last few pages contain a description of Harter's flexible ball joints for piping, Kent wing wall furnace and Duval metallic packing.

Disk Fans.—American Blower Company, Detroit, Mich. Mailing card. Gives views of disk fans driven by open and inclosed types of Westinghouse motors.

Chain Blocks and Electric Hoists.—Yale & Towne Mfg. Company, 9 Murray street, New York City. Pamphlet. Concerns particularly the exhibits of the Yale & Towne Mfg. Company at the recent railway appliance exhibition in Washington and the railway conventions at Manhattan Beach. The exhibits included triplex, duplex and Weston differential blocks and the electric hoist described in *The Iron Age* July 7, 1904.

Air Compressors.—Ingersoll-Sergeant Drill Company, 26 Cortlandt street, New York City. Publication No. 340, entitled "The Blue Book of Air Compressors." Describes briefly the standard classes of Ingersoll-Sergeant air compressors, illustrating them with small half-tones. Other products of the company are also briefly referred to, including regulators, rock drills, hammers, quarrying machinery and pneumatic tools.

Trolley Line Construction.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Circular No. 1110. Describes the Westinghouse catenary line construction for high tension trolley roads operating at pressures up to 6000 volts or more. It is especially designed for use in conjunction with Westinghouse single phase alternating current equipment. Descriptions are given of single catenary and double catenary and details of the parts, including brackets, hangers, insulators, wire, turn-outs, cross spans, &c.

Friction Draft Gear.—Westinghouse Air Brake Company, Pittsburgh, Pa. Illustrated catalogue; size, 6 x 9 inches; pages, 54. Gives a description of the construction and application of the Westinghouse friction draft gear to freight and passenger cars and locomotive tenders. The half-tones show the interior and exterior and the manner in which it is attached to cars of various construction. An interesting part describes experiments with a train of 35 loaded steel cars, all equipped with the draft gear, and tabulated data is given of dynamometer car tests.

Pneumatic Rock Drills.—Ingersoll-Sergeant Drill Company, 26 Cortlandt street, New York City. Bulletin No. 2003; a new edition of No. 2001, recently issued. Contains information of interest in regard to the new hammer drill for rapid rock drilling, known as the Little Jap. The new edition of the bulletin contains some additional information to that presented in the first edition. Half-tones show the adaptability of the drill in confined localities and difficult situations. It may be held in the hand or mounted on a tripod or other support, and is made in three types for different classes of service. Many features of the drill are those found in other pneumatic tools made by the same company.

Self Oiling Engines.—The Russell Engine Company, Massillon, Ohio. Six half-tone plates. Show various views of a new inclosed type of engine. The principal aim in the design of the engines was to so construct the wearing surfaces and to provide means of lubricating as to render unnecessary any great amount of attention. For this reason the engines are particularly adapted to office buildings and isolated plants.

Gasoline Engines.—Cooley Mfg. Company, Waterbury, Vt. Leaflets. Contain half-tones and descriptions of Cooley gasoline engines of stationary and portable patterns. In the latter form the engine is supplied with a fuel tank and is mounted upon a frame with handles by which two men can carry it. This design is especially fitted for farm work. The marine engine is of the same general type.

Railway Shop Tools.—Niles-Bement-Pond Company, 111 Broadway, New York City. The July issue of the *Progress Reporter* contains a very interesting series of half-tone engravings from photographs taken in the Angus shops of the Canadian Pacific Railway at Montreal. These show a number of Niles-Bement-Pond tools, notable for their size, producing capacity or peculiar adaptability to the work.

Locomotive Flues.—Detroit Seamless Steel Tubes Company, 804 Union Trust Building, Detroit, Mich. Circular. Gives 13 arguments in favor of the use of Detroit locomotive flues.

Assayers' Scales.—Salt Lake Hardware Company, Salt Lake City, Utah. Four circulars. Pertain to Keller assay balances. These are made in various grades and styles, depending upon the degree of sensitiveness required. Two patterns are made at comparatively moderate price where measurements are necessary only to 1-100 mg. The circulars give illustrations of the scales with specifications and prices.

Gas Engine Igniter.—Goodson Electric Ignition Company, Providence, R. I. Booklet. Gives points to be considered in selecting an igniter and shows wherein the Goodson Igniter and spark plug covers these points. The device is independent of batteries or spark coil and is guaranteed to produce a spark sufficient to start a gas or gasoline engine, no matter how slowly the fly wheel revolves.

Machine Tools.—P. Blaisdell & Co., Worcester, Mass. Catalogue, 6 x 9 inches; pages, 70. Gives illustrations and specifications of a line of engine lathes from 13 to 30 inches swing. These may also be furnished in motor driven form. Also shows pattern makers' lathes of 15 and 20 inch sizes and speed lathes of 10, 12, 15 and 20 inch sizes. The remainder of the catalogue is given to a similar treatment of drills from 20 to 50 inch sizes and the Blaisdell crank planer.

Traction Engines.—Holt Mfg. Company, Stockton, Cal. Bulletin No. TE-19. Describes the Holt Bros.' traction engine and shows the uses to which it may be put in extensive agricultural work. An accompanying circular is a reprint from a daily paper concerning the notable work performed by California combined harvester traction engines made by this company.

New York Pig Iron Warrant Market.

Interest in the Pig Iron Warrant market in the Produce Exchange was quickened somewhat during the week ending at noon on Wednesday, the sales amounting to 1500 tons, which was 800 tons in excess of the sales recorded during the previous week. One sale of 500 tons of December Foundry was recorded as being the largest lot sold in one transaction in several weeks. The price was \$15.45, and other sales were as follows: 300 tons October foundry, at \$15; 200 tons October foundry, at \$15.10; 100 tons October foundry, at \$15.15; 200 tons September foundry, at \$15.10, and 200 tons November foundry, at \$15.45. The following prices were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	\$14.50	\$15.25	.....	.....
July	14.80	15.20	\$15.00	\$15.40
August	14.80	15.20	15.00	15.50
September	14.80	15.20	15.10	15.50
October	14.75	15.25	15.25	15.45
November	14.75	15.25	15.30	15.45
December	14.50	15.25	15.40	.....
February	14.75	.....	15.35	.....

New England Foundrymen.—The New England Foundrymen's Association held its July meeting in the form of an outing at Nantasket, Boston harbor, July 12, 43 members passing a very enjoyable day, including an excellent dinner and a carriage drive about the resort. At the meeting following the dinner the death of Alva Carpenter of the A. Carpenter & Sons Foundry Company, Providence, was reported, and President John Magee appointed A. J. Miller and Theodore H. Colvin, Providence, and Secretary Fred. F. Stockwell as a committee on resolutions. The next meeting will be held as an outing at Providence, August 9, on invitation of members from that city.

In the last week in June the Lukens Iron & Steel Company's plate mill at Coatesville, Pa., produced 4819 tons.

The Southern Pacific Company has placed a contract with the Fore River Shipbuilding Company, Quincy, Mass., for the construction of a 6000-ton turbine freight and passenger steamer. The steamer will be operated on the Morgan line between New York and New Orleans and will, it is said, be the largest turbine ship yet built in America. It is to have a speed of 16 knots.

A successful flight was recently made by M. Lebaudy in a dirigible balloon from Nantes to Meaux, France. The distance was 60 miles and much of the trip was made against the wind. Continuing from Meaux to Laferte a 15-mile trip was made dead against the wind. An average speed of 14 miles an hour was attained.

Owing to an error in the advertised plans, the Bridge Department, New York, has amended the plans for the Williamsburgh Bridge subway terminals. The modifications will postpone the beginning of the improvements until the fall.

The New Jersey Bridge Company.

Several good sized contracts have recently been booked by the New Jersey Bridge Company, filling its plant at Manasquan, N. J., considerably beyond its capacity and making immediate expansion necessary. About \$10,000 worth of new machinery, including punches, shears and cutting-off machines, is now being added, which will fill the present buildings to their utmost capacity. An extension to the structural shop is planned, which will be built as soon as possible and will require the further purchase of new machinery. There is a project on foot, however, looking toward a very much larger scheme of extension which may involve the construction of an entirely new plant of generous proportions by next spring.

The present organization was perfected and started working on March 3, last. Since that time a large contract for new repair shops, machine shop extensions and craneways for the storage yards of the Philadelphia & Reading Railroad, at Reading, Pa., was awarded to the bridge company. This material is now being shipped. Contracts were also secured from the New York Edison Company for new substation buildings to be erected on West 27th street and a fair sized contract has just been completed for the Brooklyn Edison Company. For the Brooklyn Heights Railroad Company the company has just finished the 36th street and 5th avenue extensions to the elevated structure. In addition to this work, smaller contracts aggregating about 5000 tons are under way.

The company is now in the control of F. M. Peet and F. M. Wyant. Mr. Peet, who is president, was formerly manager and treasurer of the Ohio Tube Company, of Warren, Pa. Mr. Wyant, who is treasurer and general manager, held the same positions with the Wrought Iron Bridge Company, of Canton, Ohio, until the absorption of that company by the American Bridge Company. After the consolidation, Mr. Wyant became assistant treasurer of the American Bridge Company with headquarters at New York and Chicago, holding this position until last February. J. H. Wynkoop is vice-president and in charge of the contracting. J. M. Braly is secretary and engineer and E. W. Stearn, formerly with the Berlin Bridge Company and later plant manager of the East Berlin plant of the American Bridge Company, is superintendent.

The plant at Manasquan now covers about eight acres and is located on the Pennsylvania and Long Branch Railroads. It is running double turn.

Free Alcohol for Industrial Use.

WASHINGTON, D. C., July 18, 1905.—The Treasury Department is in receipt of a memorandum prepared by the committee of manufacturers engaged in promoting the campaign for free denaturalized alcohol for industrial purposes, in which is presented a strong argument for the removal of the present tax, amounting to about 1100 per cent., for the special purpose of rendering grain spirits available for use as fuel for small engines. Several publications in *The Iron Age* on this subject are quoted by the committee and the prediction is made that the removal of the tax on denaturalized alcohol would double the power uses of the country in a very short time.

Cheap Alcohol in Cuba.

In this connection Prof. Elihu Thompson, the eminent electrician and scientist, is quoted as follows:

There are some facts which are not generally known which ought to be known—namely, that alcohol is produced and sold in Cuba for from 12 to 15 cents per gallon, and that it is an excellent fuel, as I have found by tests, for the running of engines for automobiles, taking the place of gasoline. At 15 cents or 20 cents a gallon I think it would eventually displace gasoline. Burned in similar engines it produces no smoke or soot nor disagreeable odor. Since alcohol mixes with water freely a fire started with alcohol is one of the easiest to extinguish. This is not the case with gasoline or even kerosene, both of which float on water and continue burning.

To my mind the farmer should be the most deeply interested in the production and use of alcohol for industrial purposes, and especially in its use for automobile and motor boat propulsion. It would give the farmer a sort of balance wheel. A crop that is not easily marketable or a crop partly spoiled, be it fruit, grain or other product, could be made the source of cheap alcohol for industrial purposes. Alcohol can be stored in tanks for an indefinite period without deterioration.

Dr. H. W. Wiley, chief of the Bureau of Chemistry of the Department of Agriculture, states that he has long been convinced that the free use of alcohol for technical purposes "would not only give immense impulse to manufacturing industries now languishing in this country, but would also prove of great benefit to agriculture by providing an outlet for a great many starchy materials unfit for or unnecessary to consumption, and which would find a ready market in the form of alcohol for technical purposes." Dr. Wiley also expresses the opinion that there would be no loss in the national revenue by granting the free use of alcohol in the arts.

Alcohol vs. Gasoline.

Discussing the relative merits of alcohol and gasoline for fuel purposes the committee quotes an article in *The Iron Age*, in which the reasons for the superiority of alcohol are given. In conclusion the committee says:

The desirability of alcohol for motor fuel purposes is thus shown to be beyond question, and the enactment of legislation providing for its industrial use free of taxation would have the immediate effect of checking the advancing price of gasoline. The effect of the enactment of a tax free denaturalized alcohol law on the price of gasoline is further shown by the fact that alcohol would largely take the place of gasoline for cooking, heating, illuminating and many manufacturing processes, and the present enormous consumption of gasoline for these purposes would be discontinued. In this way such a law would prevent the increase in the price of liquid fuel beyond the cost of alcohol. The supply of alcohol is absolutely unlimited and to a large extent it will be produced near the point where it is to be consumed.

The internal combustion engine is only in its infancy. It is the simplest and most economical of prime movers and is destined to an enormous growth. In the automobile form it will cover our highways and streets, the pleasure vehicle being outnumbered a hundredfold by the commercial machines, which will handle loads many times heavier than is now possible with horses. These conditions will be duplicated on the water. The alcohol engine will become the auxiliary of all small sailing vessels, and in fishing boats and small craft on our rivers, coasts and harbors will supplant all other forms of power. The farmer will find the alcohol engine the cheapest and most efficient of all hired help and no farm will be without one or more engines. In manufacturing the increase in the use of these engines will be equally great. With gasoline as the only fuel such a development would be impossible. With alcohol it is assured.

The Revenue Question.

The measure recently drafted by the committee of manufacturers providing free alcohol for use in the arts is attracting much attention at this time among public men and high officials of the Government in connection with the discussion of ways and means of meeting the deficit in the national revenues. The shortage last year was \$23,500,000 and for the new fiscal year is estimated at \$40,000,000. The Free Alcohol bill imposes an additional tax upon compounded spirits, which constitute the bulk of spirits now consumed for beverage purposes, and would thereby net about \$30,000,000 additional revenue. The promoters of this legislation, therefore, claim that its enactment would practically close the present gap between Federal receipts and expenditures. W. L. C.

The National Association of Automobile Dealers was organized at Buffalo, N. Y., July 17. The following officers were elected: President, W. C. Jaynes, Buffalo; vice-president, Harry Unwin, New York; secretary-treasurer, H. C. Wilcox, Buffalo. Nearly all large automobile dealers in the United States were represented.

The Inland Steel Company, Chicago, started up its entire plant at Indiana Harbor, Ind., including sheet, structural and bar mills, as well as its bar mill at Chicago Heights, Ill., Monday of this week. In the Indiana Harbor plant the galvanizing department is operated for the first time, outside of the experimental test made before the close down, and the company is gratified at the success of this addition to its plant.

The continuous sheet mill of the American Sheet & Tin Plate Company, at Sharon, Pa., has been put in operation. This mill is designed to roll sheets by the Bray continuous process, similar to the process used in rolling black plate at the company's Monongahela works, Pittsburgh.

HARDWARE.

WE give in the following pages a letter from a great Hardware merchant which will command attention not only from the personality of the writer and his position in the trade but also from the interesting and forceful presentation of his views on the subject to which it relates. This communication in its frankness and ability is a notable contribution to the discussion in regard to special brands, which is only now beginning to receive the consideration in its various aspects to which its importance entitles it. While we do not agree with all the positions and conclusions of our distinguished correspondent, we are pleased to lay before the trade this candid expression of Mr. Simmons' views as explaining his position in regard to special brands and presenting a strong argument for them from the standpoint of the great Hardware jobber. This is done in accordance with the principles consistently followed in *The Iron Age* of giving the trade all that can be said on the various sides of the questions of general interest which are discussed in its columns. No one certainly is more competent than Mr. Simmons to state the case in favor of jobbers' private brands, and the views of no merchant or manufacturer would carry more weight than his.

In view of the expressions used by Mr. Simmons in regard to *The Iron Age* and its fairness and broad-mindedness in the treatment of trade questions we regret to have to take exception to the paragraph in which he touches upon the position of this journal on the subject under consideration. There is no reflection upon either the manufacturer or the jobber in the fact that these great classes take their position in regard to special brands because of the manner in which their business interests are affected by the making and selling of special brands as distinguished from factory brands. In this matter they are quite properly governed by their individual interests. Manufacturers are opposed to jobbers' private brands because they very seriously militate against their own best interests in the attaining of an honorable position in the market for their own products. Jobbers are in favor of handling their own brands for reasons very similar to those which actuate the manufacturers in desiring to market factory brands and because their own brands are supposed to contribute directly to their success as merchants. That self interest dominates the views and determines the attitude of both of these classes carries with it no reproach. It is simply business. In journalism of any worthy type other principles, however, are operative. Trade questions are to be treated on their merits, with a breadth of view, an independence of judgment, a balancing of considerations and a uniform fairness that shall avoid the errors and extremes of partisans on one side or the other, with a careful regard for all the facts, all the equities, all the proprieties—a discussion of the subject, in short, in an independent, impartial and almost judicial spirit. The moment a trade journal permits its editorial policy to be determined by its financial interests it becomes unmindful of its responsibility and dignity and descends from its high place.

After a careful ascertaining of the facts in the case and considering their bearing on all classes of the trade we have reached the conclusion that special brands under the existing system are detrimental to the best interests of the trade and of the public, chiefly because

the system tends to lower the quality of the goods. Whatever exceptions there may be there is no doubt that jobbers' special brands in a great majority of cases are in simple matter of fact of lower grade than the manufacturers' best brands. They are in a multitude of cases purchased at lower figures and with the understanding that they are not first-quality goods. In the making of special brands, too, the manufacturer, even if agreeing to furnish goods of first quality, lacks the incentive to put into them the highest type of workmanship in the fact that he makes no name for himself and establishes no reputation for his product. While there are some special brands of high quality, there are comparatively few, we believe, of the highest attainable quality. For this reason they are in the last analysis detrimental to the trade and the public. That they are detrimental to the manufacturer is conceded on all sides. The usual, though not universal, preference on the part of retail merchants for manufacturers' brands of recognized reputation indicates, if it does not demonstrate, the disadvantage of special brands to this important class. We think it will be found that even to the jobbers the sale of special brands has proven and will prove to be, in the long run, seriously injurious. They may gain something, but lose more. There are already indications that under the stress of this system something of alienation may develop and a disturbance of existing methods of distribution result. It would be, we believe, the part of wisdom for the jobbing trade to take their old and legitimate place as distributors of the manufacturers' products under the manufacturers' brands instead of insisting on substituting their own.

Mr. Simmons' letter is significant as indicating his estimate of the importance of jobbers' special brands to the great jobbers, who would indeed seem to be the only ones who can expect manufacturers to serve them in this way, while at the same time it manifests his interest in and enthusiasm for the brands marketed by his own house. If all jobbers endeavored to have their special brand goods of high quality, jobbers' special brands would not rest under the suspicion and reproach with which so generally they are regarded. Mr. Simmons' letter has, however, a more important significance as indicating the means adopted to secure goods of requisite quality. It appears that some at least of these goods are produced in factories owned or controlled by the Simmons Hardware Company. An intimation is given that this policy of thus making its own goods will be continued and may be carried out even more extensively. This certainly reveals an interesting condition of things and an important tendency in the trade.

It is obvious, however, that just as far as this course is pursued the special brands thus produced become factory brands even though manufactured by a jobbing house. Merchants who thus become manufacturers can very properly point out to their customers that the goods in question, made in accordance with their advanced ideas and wide experience and under their control throughout all the processes of manufacture, avoid the snares and pitfalls which lie in wait for the ordinary special brand goods. That it should be necessary for a jobbing house thus to control the manufacture of its goods is a significant acknowledgment of the justice of the position of those who maintain the higher quality of factory brands. The point made by Mr. Simmons may count in favor of his own goods thus made, but it furnishes both an argument and an illustration for those

who maintain the general inferiority of special brands. The moment the jobber becomes a manufacturer of what have been special brand goods these goods cease to be special brands and become factory brands.

How far this tendency on the part of jobbers to enter the manufacturing field will go is an interesting question. On another page of this issue will be found the announcement of the organization of a new company for the manufacture of Shovels and related goods in the management of which are some gentlemen prominently identified with jobbing interests. It would certainly be a matter for regret if the jobbing trade should abrogate their position as distributors of the manufacturers' products and become their competitors. It does not need to be pointed out that in this way there might result a state of things very different from that which would continue if the jobbers were content to be the channel through which the manufacturers' products pass to the retail merchants and thus to the consuming public. When, however, the jobber, posing both as distributor and manufacturer, endeavors to carry water on both shoulders something is likely to happen.

Condition of Trade.

Business continues quiet, but the reports which come from manufacturers in regard to the first half of the year indicate that the six months' business was on the whole of very satisfactory volume, several of them referring to their trade as having been exceptionally good. The prevalence of warm weather naturally has the effect of repressing trade in the immediate present, but the tone of advices from all classes of merchants and manufacturers is encouraging and even confident. With the practical assurance of good crops and the prevalence of generally prosperous conditions the outlook for the remainder of the year is full of promise. There is also evidence of an improved tone in the matter of prices, even though it does not, however, show itself in any actual advances. It is the opinion of many that before long buying will be resumed by the leading houses and that their orders will cover good quantities of goods. There is, however, a disposition on the part of the jobbing trade and the better class of retail merchants who are in touch with the manufacturers to conduct business conservatively and not purchase at all speculatively. The vacation period is naturally interfering more or less with business, while various trade questions of recognized importance are attracting the attention of merchants and manufacturers, who for the time being are suspending to a certain extent the active and aggressive prosecution of their business enterprises.

Chicago.

The volume of business being transacted by retail merchants all over the West seems to be rather larger than usual at this time of year and demands on jobbers for quick shipment from stock of summer goods are of a very satisfactory character. Trade in sporting and outing goods is excellent and the unusual volume of business of the past week is doing much to offset the lateness with which this demand developed. Demand for Haying and Grass Tools is keeping up later than usual, notwithstanding the fact that it started earlier than was expected and maintained an exceptionally large volume all through the spring. The hay crop is evidently one of the largest ever harvested. Oats and rye harvest is opening up well and the heavy straw that characterizes both these crops is reflected in exceptionally good demand for binder twine. Sisal Twine and Rope are unexpected-

ly weak, while Manila maintains its strength. Demand for Garden Hose is still lagging on account of the continued wet weather. Demand for fall goods is picking up nicely and there is a prospect that merchants will order in their goods, if anything, a little earlier than usual, although the orders thus far placed for shipment are for samples only in the majority of cases. Merchants' stocks in general are pretty well thinned out, notwithstanding the fact that their purchases earlier in the spring were heavier than customary. Wire and Nails are seasonably quiet, but the undertone is strong in spite of sporadic price-cutting on the part of some of the weaker interests. July thus far has been an excellent month and prospects are for a continuation of business activity throughout the month.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The "mid-summer dullness" that Wall Street usually talks about at this season of the year has apparently not yet reached this section in a way to affect the jobbing Hardware business as a whole. Notwithstanding this there is much complaint on account of the daily rains, but undoubtedly as usual the extent of the damage is somewhat exaggerated. The farmers, while formerly and at present the most bitter critics of trusts and combinations, are as producers of tobacco still trying to get together to enjoy the benefits the newspapers tell them the trusts themselves have secured for so long. Much of the 1904 crop of "dark" tobacco is still in the hands of the farmers unmarketed. The price offered for last year's crop of "dark" tobacco was so low that the farmers refused to part with it except where necessity required and it is quite possible that on account of the damage done the 1905 crop the remainder of the old 1904 plus that of the reduced 1905 may be marketed at a price that will make a pretty fair average for the two years. To sum up, while some of the leaders are endeavoring to get all the others together for the purpose of acting in the matter, nature probably performed the real service.

Inasmuch as we are in the Hardware business, which in itself alone we believe is the most interesting in the world, and therefore not being obliged to make excursions into other lines, as insurance people seem to find necessary, we hope to be pardoned should our report seem a bit prosy this week.

St. Louis.

NORVELL-SHAIPLEIGH HARDWARE COMPANY.—Salesmen report too much rain in the Southern States, which is injuring the cotton crop. In a large part of the territory tributary to St. Louis a fine wheat crop has been harvested. Prospects for a bumper corn crop are excellent. A study of the crops of the various sections of this country year after year impresses one with the law of compensation. Lean years follow fat years. When it is good in one section it is bad in another, and these good and bad times alternate in groups of years.

The writer has just returned from Oklahoma City, Okla. Ter. The convention of the Hardware merchants of Oklahoma and Indian Territories and the Statehood convention were assembled at the same time. This Statehood convention seeks the union of Oklahoma and Indian Territory as one State. True Western enthusiasm was the order of the day. The push and enterprise of the people of Oklahoma Territory are illustrated in the wonderful development of Oklahoma City. Eighteen years ago where this enterprising and progressive city stands there was nothing but a wilderness. Now they have electric lights, waterworks, paved streets, electric street cars, solid blocks of substantial brick and stone business houses, a splendid opera house and handsome residences surrounded by green lawns and shrubbery, indicating the cultivation and refinement of the residents.

Surely a wonderful country covered by flourishing towns! What a land of promise and opportunity! Wheat, corn, oats, flax, tobacco, cotton, horses, cattle and hogs, and cool nights giving a respite from the heat of the day. There will be wonderful development in this region within the next five years. Good merchants and young men with a moderate amount of capital who are being

cramped in their efforts in the crowded East, where business is overdone, should take a look at this Western empire.

The Hardware convention was well attended and the earnestness of the members in discussing the various questions which came before them promises good work in the future by the merchants of Oklahoma and Indian Territories in straightening out some of the kinks in the Hardware business.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—Trade conditions continue favorable. The rains that have continued in excess for several weeks ceased some ten days ago and since that date the weather has been very favorable and crop prospects are now good.

We are now within less than a month of the beginning of the harvesting of spring wheat and other small grain, and with favorable weather we may hope for an abundant yield. The excess of rains has injured crops in the lowlands, but the losses thus far do not exceed those we usually have yearly from one cause or other.

We shall doubtless have further losses before the crops are saved, but at this writing the conditions are favorable for an abundant harvest. In making calculations, however, we must not forget that crops at this stage are overestimated. It is yet too early for any but grain gamblers to base the price of grain the coming year on the present conditions in the Northwest.

The volume of Hardware trade compares favorably with preceding years and promises to continue satisfactory.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—With two hundred and thirty-six Pullmans rolling into the Rose City in three days an idea is formed as to whether the Lewis and Clark Exposition is to be a success. The National Medical Association is now in session, fifteen hundred delegates registering the first day. As nearly all these delegates have crossed the Continent, we feel it a great compliment to the Exposition itself as well as to our summer climate. It is the universal verdict that in its location on the lake, buildings, exhibits and electrical display at night this Exposition is unsurpassed by any heretofore held.

We are now, as regards business, between hay and grass, waiting for the harvest, which still promises to be bounteous. Trade halts, of course, waiting the outcome of harvest and the busy time incident to gathering it.

Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—This is harvest season; consequently a lull in trade is in order. The yield of small grains now being harvested is very large and the quality well up to the average. The weather recently has been about all that could be desired with the exception of a superabundance of moisture, which has somewhat retarded the growth of the corn crop as far as the low or bottom lands are concerned. Corn is the main crop in this section, and upon the production of this cereal the prosperity of this region largely depends. From extended reports received there appears to be hardly any doubt but what a heavy crop of corn will be harvested. Farmers are obtaining substantial values for all their products; consequently money is plentiful, and business men are looking forward with confidence to a strenuous period in all departments.

Philadelphia

SUPPLEE HARDWARE COMPANY.—Very little can be said in regard to trade conditions since our last letter to *The Iron Age*. Locally the Hardware trade like to have a vacation whenever possible during the month of July and the person in charge of buying is frequently found absent on vacation, although a fair number of mail orders are received and salesmen in some sections are sending in fair orders.

It is gratifying, however, to see that the cotton prospects throughout the South are very good and an increase in agricultural products is expected through the Southern sections. There is quite an optimistic view in regard to

the wheat crop for the season of 1905, and therefore the outlook is bright and fair for the season which we look to open somewhere about August 1. There is very little agitation of any nature whatever in regard to prices, and collections are as fair as are usually expected this month of the year.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The midsummer business is running along about as usual and a great many traveling men are of course taking their vacation, also the housemen. Orders are coming in a little more freely than they were a few weeks ago and the trade in fall and winter goods is increasing. All reports indicate that the cotton crop will be short this year, but the recent advances in the price will more than overbalance the light crop. Collections are very good.

NOTES ON PRICES.

Wire Nails.—Something of an improved demand is attributed to more liberal specifications from those whose contracts expire within a short time. With the exception of some shading of prices at competitive points the market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....\$1.80
Carloads to retailers.....1.85

New York.—The demand, particularly for small lots from store, is very fair. Mills are shipping promptly, but delays in transit are annoying jobbers to some extent. The market remains firm and prices are unchanged, as follows: Single carloads, \$1.99; small lots from store, \$2.05.

Chicago.—Jobbers as a general rule quote lower prices to consumers than mills will quote. A feeling is prevalent that surplus stocks in jobbers' hands are being quite rapidly depleted, as the demand for Wire products is better than usual for midsummer. Quotations are on the basis of \$1.95 in car lots to jobbers, \$2 in car lots to retailers, with 5 cents advance for less than car lots from mill.

Pittsburgh.—Demand has shown some improvement in the past week. Some contracts will expire shortly, and there is better specifying by those who hold them. Stocks have been materially reduced. There is still shading at certain competitive points from the regular prices of \$1.80 in carload lots to jobbers and \$1.85 to single carload buyers, actual freight from Pittsburgh being added.

Cut Nails.—A meeting of the Cut Nail Association is scheduled for July 26. Demand is not heavy, prices continue below official quotations and for carload lots \$1.70, base, f.o.b. maker's mill, may be named. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails. These quotations are shaded quite frequently.

New York.—Cut Nails are in moderate demand. New York quotations are as follows: Carloads on dock, \$1.89; less than carloads on dock, \$1.95; small lots from store, \$1.95 to \$2.

Chicago.—There is scarcely sufficient trading to make a market, but this is a condition that usually prevails at this season of the year. Prices range quite generally from \$1.90 to \$1.95 for car lots to either consumers or merchants, with \$2 asked for reasonably large lots less than car lots. Store prices range from \$2 to \$2.10, according to size of order.

Pittsburgh.—Demand is not very heavy. Regular prices are \$1.70 for Steel Cut and \$1.80 for Iron Cut f.o.b. mill, but on carload and larger business to good buyers about 5 cents per keg less is done.

Barb Wire.—The market does not show much activity as far as business is concerned. Some of the smaller mills and jobbers who have stocks on hand are shading prices to some extent. Quotations are unchanged, as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

Chicago.—The fine crop prospects are resulting in a good inquiry for Barb Wire and prospects are that the fall trade will be highly satisfactory. Official prices are as follows: Painted Wire, \$2.10; Galvanized, \$2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, \$2.25; Galvanized, \$2.55; Staples, Bright, in car lots to jobbers, \$2.05; Galvanized, \$2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Demand is quiet, and prices are being shaded more or less by jobbers who still have some stocks and by some small mills. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

Smooth Fence Wire.—Generally the market is firm, but at some competitive points official quotations are being shaded slightly. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	\$1.65
Retailers, carloads	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized.....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

Chicago.—Manufacturers of Wire Fencing have as a rule not yet contracted for their Wire for the coming season. Quotations are on the basis of \$1.80 for Annealed, car lots to jobbers, and \$1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—At some competitive points the regular prices are being shaded slightly, but in general the market is firm. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.65
Retailers, carloads.....	1.70

Bolts, Carriage, Machine, etc.—The Bolt market retains the features of irregularity which have been commented upon within the last few weeks. Prices still show a tendency to weakness, as some manufacturers are reported to be sending out quotations a shade below the market and pressing with inducements buyers who are at all disposed to talk business. In this condition the opinion is expressed that a little more backbone on the part of the rest would hurry buyers into the market and lead to an advance. It is probable that even a slight stiffening of prices at this time would be considered indicative of an upward tendency for the season and some activity would immediately develop. Signs of improvement are not entirely lacking, for business is nowhere unusually dull either with jobbers or manufacturers, and most retailers report a satisfactory summer trade. In fact it would appear that the latter are paying a little more for Carriage and Machine Bolts than they did a few weeks ago, indicating that jobbers have no surplus stocks which they are anxious to market, although there are also some low quotations being made by them. Jobbers in general are carrying unusually light lines, buying only to supply immediate needs and placing large orders only on a protected basis. The following quotations may be taken as fairly representing the market, although good buyers can undoubtedly secure additional discounts:

	Discount.
Common Carriage Bolts, cut thread, ½ x 6 and smaller,	75 and 10 %
Common Carriage Bolts, rolled thread, ½ x 6 and smaller,	75, 5 and 10 %
Common Carriage Bolts, cut thread, longer and larger,	65, 10, 2½ and 10 %

Bolt* Ends.....	70, 2½ and 10 %
Machine Bolts, ½ x 4 and smaller.....	75, 2½ and 10 %
Machine Bolts, longer and larger.....	70, 2½ and 10 %
Coach Screws, G. P.....	75, 12½ and 10 %
Lag Screws, C. P.....	75, 17½ and 10 %

Window Glass.—At a meeting of the Western Window Glass jobbers, held July 13, the price of Glass was advanced 10 per cent. A meeting of Window Glass manufacturers was held the first part of last week, attended by manufacturers representing over 1300 pots, and it is reported that the utmost harmony prevailed, and that the National Association of Window Glass Manufacturers was again put upon a working basis. An attempt will be made to bring all hand operating manufacturers into this organization.

Rope.—The market continues to lack strength and demand is not particularly brisk. The variety and corresponding prices of Manila Rope are almost endless. In some instances a mixed Rope is made more attractive in appearance by bleaching than the darker colored pure article and preferred by some of the trade. Such Rope is sometimes satisfactory for ordinary uses, where life or limb is not at stake. General quotations, on the basis of 7-16 inch diameter and larger, are as follows: Pure Manila, 11½ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 cents per pound, the above figures being shaded ¼ to ½ cent per pound, according to seller and buyer.

Binder Twine.—The demand has become more active with the harvesting of oats. Reports indicate that the general price of Sisal and Standard Twine is 9½ cents and that extremely low quotations have been withdrawn.

Oils.—**Linseed Oil.**—During the week under review there have been two advances in the price of Oil of 1 cent each. The Seed and Oil market appears to be under the control of the largest interest, so that changes in prices are arbitrary to a large extent. Prices may advance further. Demand is confined to small lots for immediate use, but a large volume is being sold on this basis. New York quotations are as follows: City Raw, 52 to 53 cents per gallon, according to quantity, and State and Western Raw, 50 cents.

Spirits Turpentine.—After fluctuating during the week, the local market is higher than last quoted, owing to buying by Southern operators in Savannah for export. The local market is firm and an improvement in demand, in jobbing lots, is reported. New York quotations, according to quantity, are as follows: Oil barrels, 62½ to 63 cents; machine made barrels, 63 to 63½ cents per gallon.

THE MODERN IRONMONGER.

"THE MODERN IRONMONGER" is the title of a book recently issued by the *Ironmonger*, 42 Cannon street, London, E. C., England. Recognizing that there is a commendable spirit of inquiry abroad, the publishers state in a prefatory note that the aim of their publication "is to serve as an instructor and guide to those who would rank among the complete Ironmongers (complete as regards knowledge of their business and the power to apply that knowledge) of the present day." The book contains a discussion of the establishment and operation of a Hardware store, beginning with the shop and fittings, which are illustrated with plans and cuts; running through organization and management, business systems, stock taking, tables and formulæ in regular use and closing with a discussion of side lines, including Paints and Oils, China and Glass, Electrical Supplies, Cycles, Sporting Goods, furniture, etc. There are illustrations of racks, bins, drawers and filing cabinets, reproductions of cards, blanks, labels and tags required, and specimen bills, ledger entries, balance sheets and form letters which will serve as a guide to the beginner in business and will be suggestive and helpful to merchants of experience who desire to be advised in regard to other methods than their own. It is a useful and creditable work. The book contains more than 300 pages; price five shillings, net.

Correspondence.

E. C. SIMMONS ON SPECIAL BRANDS.

To the Editor: I write to thank you for the very fair, friendly and interesting notice in your issue of June 22 of our "Testimonial Book."

I know that you are on the other side of that argument, and if I were in your place, managing and owning a valuable trade journal which derives its principal support from the advertisements of manufacturers, I would be on that side too. It's but natural you should advocate that which is more profitable to you when no particular principle is involved in the matter.

Your comments on our book are not only fair but generous, and serve only to confirm the opinion I had long ago formed of your broadminded views as so frequently expressed in your almost invaluable journal. It appears to me that our "Testimonial Book," with about 750 letters from all parts of this country from as many merchants and business houses bearing positive testimony to the fact that our brand of goods sells well and at a fair profit, and although always fully warranted by them to the consumer never fail to give satisfaction, must convincingly refute the oft repeated statement that private brand goods are of inferior quality as compared with standard brands. As a matter of fact, we do get and always have the best goods that are made for our special brands, many of which we obtain from factories which we or some members of our company own or control by reason of a money interest in them, which in cases amounts to a controlling vote of the stock of the company.

To show how sincere we are in this matter we have had for a long time a standing offer of a reward of \$100 to any employee of our company who will tell us and convince us when or how we can get a better Tool, better quality or finish than those that bear the brand "Keen Kutter." This little book of testimonials has been of great value to us and has been most cordially received by the trade. It has been out just two months and during that time our business has been exceptionally large and unusually satisfactory, and we attribute a great part of it to the influence of this book.

Merchants are in business to make money; that's the primary object and in most cases the sole object. If a man can make more money and make it more satisfactorily by selling private brands, why not let him alone? Why try to take him from that which he has found his best means to make his business profitable? Do you doubt this? Here are 750 practical, every day, active, successful merchants who assert that they find this to be the fact. What facts have the opposition to gainsay it? Absolutely none.

The trouble in this matter is chiefly the fault of the manufacturer who will make for any little jobber, and often for a retailer, a small lot of goods under their special brand when the order is so small it should properly go to the jobber. Recently we bought out the Nelson-Holliday Bouquet Hardware Company of Minneapolis and in their stocks we found a lot of goods of their own brands; goods in unreasonably large quantities and unsalable. For example, I saw there recently enough goods of one kind to last Simmons Hardware Company in a regular way for two years; all "special brand" goods, and yet Simmons Hardware Company has sold in one week more than this house sold in a year. Why should manufacturers have made those special brand goods? They should not. The order was not large enough to justify it, and yet it sadly overstocked the house and in that sense did them an injury. Another case that came under my notice this year: I was in a large city more than 500 miles from St. Louis and I heard of a retail Hardware store just opening up with a capital of \$25,000. I called and tried to interest them in Keen Kutter goods, but they only laughed at me and said they had ordered all their Tools made under their own brand, and that they proposed to do as S. H. Company had done—viz., to build up a great name for their own

brand goods. I said: "Do you realize that we began this in 1872, a matter of 33 years, or one-third of a century, ago, and have never let up on it a minute?" They said no, they thought Keen Kutter goods were comparatively new.

I tried to find out how many they had ordered but could not, but from what was said I took it to be five dozen Hand Saws and three dozen Chisels of a kind. Now my contention is that the manufacturer should never have accepted such an order and that the manufacturer and not the jobber is responsible for the evil, if evil it be.

Can it be done away with? Never. It has come to stay. It stands to reason that the large jobbers would at once look about them to find some small factory they could buy into or start one by hiring and making it interesting to certain skilled workmen. I don't wish to say anything that would have the slightest appearance of a threat, but I do say the jobbers would not submit to it even if they had to club together to buy out or build factories. Let manufacturers have a quantity limit for jobbers only. That's the best remedy, and let them not do for some man who wants five dozen Saws or 100 dozen Files what they do for some jobber who orders at one time 1000 dozen Saws or 50,000 dozen Files.

E. C. SIMMONS.

MR. NORVELL'S ARKANSAS CREED.

To the Editor: In *The Iron Age* of June 29 I observe among the proceedings of the Arkansas Retail Hardware Association a "creed" which Mr. Norvell of St. Louis has kindly formulated and declared for the manufacturers and which he apparently assumes he is better able to prepare for them than they are able to do for themselves.

Recognizing Mr. Norvell not only as a prominent and successful merchant, but as an honorable gentleman who would not distort the truth, except, perhaps, in jest, I beg a little space in your columns to call attention to a few of the twenty-nine articles of faith which he has formulated and which, though presented apparently as a joke, have a vein of seriousness characteristic of many jokers who have the gifts of a writer which are ascribed to the author in question.

REBATE PLAN.

At the outset (if I may be serious) I venture to assert that not one of the articles which he has prepared represents a real belief which has been expressed or which is entertained by any reputable body of manufacturers, and each is too narrow in spirit to be seriously believed by Mr. Norvell himself or by any of the large jobbers whom he especially represents. Any one of Mr. Norvell's articles of faith is as good as another to illustrate this point. Among these declarations he says (for the manufacturers, of course):

We believe in selling our goods on the rebate system, by which we hold all the jobber's profit on our goods for several months until he makes us a statement that he has not cut our prices.

It has been my opinion that manufacturers generally do not believe in or use the rebate plan. A few of them whose goods have been slaughtered by jobbers who disregard the interests of other jobbers have been compelled, for the protection of those other jobbers, to restrict the prices at which their goods shall be sold; hence the rebate. Jobbers who believe in a stable market seem to favor the idea.

From a selfish standpoint it must be evident that it is of no interest to the manufacturers to what extent the merchant shall cut the prices on his goods, but manufacturers do like to protect their trade.

"POWERFUL" JOBBERS.

The next article, however, seems to present the grounds for the article just quoted and is as follows:

We believe in having a fixed selling price for a certain territory so no one jobber can get more than a certain amount of business. This jobber might become too powerful.

This proposition is evidently written from the standpoint of a powerful jobber and probably of one who has not been discriminated against by manufacturers.

I do not know the manufacturer who objects to any jobber becoming more powerful, provided that jobber does not unreasonably slaughter prices and injure other jobbers and demoralize the trade. When an aggressive cutter of prices who regards a great volume of business as the index of power makes it impossible for himself or any other merchant to make any profit on that manufacturer's goods there is a strong temptation for that manufacturer to say to the powerful jobber: "If you buy more of my goods I will hold back a rebate for a period as an earnest that you will let your brother merchants who are also able to pay for their goods live in peace and grow as you would grow and to protect my goods." It is simply a mild preventive of commercial suicide and bankruptcy.

Mr. Norvell is frank in his suggestion that the powerful should become even more powerful, regardless of the rights of the less favored.

AN UNFAIR PRESENTATION.

Another of his articles of faith for the manufacturers is:

We believe in selling grocers, catalogue houses and whatever retail trade we please.

And his concluding article is:

We believe, when the jobbing and retail trade come at us with the catalogue house question, we will stir up some mud and hide ourselves by bringing up the issue of special brands.

Is this a fair presentation of the situation? How long has it been since Mr. Norvell, the apostle, and other jobbers were supplying these now infamous catalogue houses with much of their Hardware? As has been ascertained, nearly all the Hardware sold by those houses was supplied to them by what are now called "legitimate" jobbers, and comparatively little was furnished by manufacturers. With these facts well known the retailers are urged to believe that the manufacturers are conspiring against their interests.

Without any direct interest in the Parcels Post and similar measures, except as they would benefit catalogue houses and thus injure regular merchants, the Manufacturers' Association has actively joined the merchants in opposing them. Why should a jobber refuse to admit this co-operation?

Does the author of this new "creed" really believe that to escape the issue of the catalogue house question the manufacturers "stir mud" and raise the question of special brands simply as a diversion? Does he believe that the manufacturers, who by a declaration sent to the jobbers have stated that they will preferably deal exclusively through jobbers if their goods can be properly represented, are hiding behind an issue created for the purpose? Does he really believe that the report which was adopted, as I am informed, with prompt and absolute unanimity at Hot Springs would, as he states, be indorsed by only a few of the manufacturers of the country and these few only they who decline to meet the views of the Catalogue House Committee? Of course he does not.

The views of that committee in substance, as given, are that all sales of Hardware manufacturers shall be made exclusively through so-called legitimate jobbers. The jobber alone must sell not only the retailers, but the great consumers, like the United States Government, municipalities, large contractors, railroads, and in many cases the smallest consumers. Thus far their views have been met by many Hardware manufacturers, a condition which does not exist in most other lines of manufacture, of which the Shoe trade is a fair example. Shoe manufacturers sell to retailers. The jobbers, apparently unwilling to foster this condition, which has been strengthened by the action of the Manufacturers' Association, in practice furnish no goods to any of these customers which bear the name of the manufacturer unless such goods are insisted upon by the buyer. In short, neither the retailer

nor consumer must be permitted to know who made the goods for which he has paid his own money.

COMMON INTERESTS.

This is the issue, and it is not created with a view to avoid the catalogue house or any other question. It is not a question whether or not a manufacturer will make his own brand of goods as carefully as he will the private brand of a jobber; that is for the consumer to decide. This is not a situation which is improved by threats or severe denunciation. The manufacturers and jobbers have interests in common and should endeavor to harmonize these matters.

I would not now ask space to review the other twenty-seven articles of faith, but must confess that Mr. Norvell's "creed" is an exceedingly bright paper as a satire, thoroughly original and worthy to be recognized as a classic in humorous Hardware literature. Its originality is probably its most vulnerable quality. Were his articles of faith not original, but in line with the facts, they would not be so funny.

IOTA.

BRITISH LETTER.

Office of *The Iron Age*, HASTINGS HOUSE,
NORFOLK ST., STRAND, LONDON, W. C.

THERE is not much real pressure, but on the whole employment is fairly steady and the output about average. The Cycle, Motor Cycle and Motor Car industries are all busy. A good sign of improvement is that Machine Tool makers are busy, and, oddly enough, a great number of Machine Tools have gone to Russia. The rolling stock industry, with all its subsidiary departments, is busy, particularly on export account.

Considerable difficulty is experienced by Birmingham manufacturers in meeting the competition of cheap, foreign made Enameled Goods, but in the better qualities the British article still sells well, both for home and foreign account. This is notably the case in one branch of Enameled work—namely, the advertising tablet and sign—where a very large business is being done. There is a strong demand for Nuts and Bolts and greater activity may be reported in the Tin Plate trade. Builders' Ironmongery is selling well and all descriptions of Iron Fences, Hurdles and Gates. The Gun trade is improving. On export account largely increased orders have come in from India and South America. Australia is buying a large variety of miscellaneous articles, so also is New Zealand. The South African trade improves slowly, money is easier, and, notwithstanding the war, exports to China, India and other Eastern countries show no decline.

International Exhibition in New Zealand.

An International exhibition will be held at Christchurch, New Zealand, in November and December, 1906, and January, February, March and part of April, 1907. All the nations of the world have been invited to participate. The object of the exhibition is educational and it is intended to demonstrate the resources of the colony as one of the world's food producing factors, its vast mineral resources and to draw attention to its unrivaled and varied scenery, thermal wonders and also its exceptional opportunities to sportsmen. Especially is the exhibition intended to bring under the notice of the more industrial nations of the world the great field which the colony of New Zealand affords as an outlet for enterprise and for the use and consumption of all manner of up to date appliances, manufactures, &c.

A Section of the Mediterranean Trade.

Off and on for some years past I have pointed to the possibilities of increased American trade in the Mediterranean, and particularly east of Italy. Fiume is an exceedingly convenient port for American purposes, particularly in view of the fact that a great number of steamships carry Austrian and Hungarian emigrants—over 30,000 last year—to America. The percentage of British trade is 34 per cent. of the entire sea borne trade and 43 per cent. of the foreign trade (including the national coasting trade, which is one-fifth of the whole). The respective figures in 1903 were 36 and 45 per cent.

The percentage of other countries in the foreign trade was as follows: Italy, 12; France, 8; Turkey, 6½; Argentina, 5½; others, 25. The tonnage of shipping amounts to 2,233,000 tons, which is an increase of 226,000 tons, or 11 per cent., of which increase 154,000 tons are British, 37,000 tons are Austro-Hungarian, 12,000 tons are Italian, 23,000 tons are sundry. The increase of 130,000 tons in the British tonnage is due to emigration to the United States and 20,000 tons to maize cargoes from Argentina. The value of cargoes entered under the British flag was £1,096,000, and of those cleared £720,000, a total of £1,816,000, as compared with £1,837,000 in 1893 and a five years' average of £1,940,000.

Glasgow and Cuba.

Trade between Glasgow and Cuban ports appears to be developing to such an extent as to demand a monthly direct service. This, it may be said, is practically in operation, although the vessels engaged are managed by different interests. Early in May the Larinaga Line steamer Niceto picked up a considerable amount of freight at Glasgow, and it is possible that the deep appearance of the Spanish vessel as she cleared the harbor may have suggested to others that there was something in the trade. As West of Scotland cargo for Cuba has hitherto been extensively shipped via Southern ports, it is quite possible that, worked in conjunction with other United Kingdom seaports, a direct service from Glasgow would pay. Last month the Direct Line dispatched their new steamer, Crown of Arragon, to a number of ports in Cuba, and in July the Sierra Line will put a steamer on the berth at Glasgow to load out for Cuba.

Our Friend the Retail Hardwareman.

BY J. B. WOODY.

THE American Hardware Manufacturers' Association and the Southern Hardware Jobbers' Association have had their annual meetings and discussed conditions as seen by the members of each association. They were thoughtful enough to acknowledge that they had a hard nut to crack and to call upon our friend the retailer to aid them in solving their most perplexing questions. The manufacturers and the jobbers each had their little war dances and returned home the better to prepare themselves for that happy hunting ground, doubtless believing that they had brought out facts which would be of great benefit in the future distribution of goods and to mankind in general. The manufacturer doubtless believes that he has captured some valuable tips and is happy over the results, while the jobber well knows that he has not given away the real cue to the situation, and is laughing in his sleeve. **Foxy Jobbers** The manufacturer has not come in contact with the general distributor of goods, as has the jobber. He is therefore not in as good a position to know the actual conditions as the jobber. Jobbers get their information regarding conditions in their territory from an army of salesmen, while each manufacturer gets his information from just a few jobbers. With conditions as they are it is meet for the jobber not to be too frank and honest in imparting his knowledge to the manufacturer. By virtue of this fact the manufacturer is not in possession of information which would warrant him in seeing and discussing conditions as they actually exist.

Within the past few years many changes have been wrought in the Hardware world. In the large jobbing houses old blood has given way to the new, and those who were office boys a few years ago are now presidents and general managers. Manufacturing concerns have instilled into their veins new blood and **New Blood** have done their best to keep abreast of the times, but in following the dark lantern of the smooth jobber they have been led into paths which they knew not of. There is another branch of the business which has taken on new life, and in taking on this new life has changed the plans of our large jobbing friends from Maine to California. It is the new blood in the

veins of our friend the retailer. A few years ago the retailer was not sure that he could buy a car of Nails and Wire and in any reasonable time get rid of it. The manufacturers of this product, however, began to send their own men into the field to solicit orders from the well organized and well rated retail houses. These salesmen began to show the large retail dealer wherein he could take hold of these lines and job them in his particular territory and do it at an advantage over the competition of any foreign jobber on earth. The retail merchants soon found that they could

Birth of the Retail Jobber

handle these goods in a jobbing way on a margin of 25 per cent. and make money. This was a small percentage, but they were satisfied with the results and have kept it up until to-day this particular line is going from the factory to the large retailer and he is furnishing all of the smaller dealers in his territory within a radius of 50 to 100 miles. These large retail dealers began to figure, and we find them becoming small jobbers in Galvanized Tubs and Buckets, Wooden Ware of every description and all other goods which were considered by the large jobber as staples and nonprofit bearing goods.

Upon further investigation we find this large retailer again at his desk in the dead hour of night figuring. What is he figuring? He is figuring the profits which he has made out of his jobbing business. Mr. Retailer, have you made any money out of your jobbing business? Yes? What conclusions have you come to regarding this branch of your business? His invariable answer is that if he can make money jobbing staples which afford from 7 to 10 per cent.

Will Increase and Multiply

profit he can also make money out of small goods, such as Pocket Knives, Shears, Razors, Fishing Tackle, &c., which bring from 25 to 50 per cent. profit. So we find the once large retail dealers now in the jobbing business, and there to stay, all over this broad land. They are making their demands upon the factory for supplies, and the factory cannot long refuse them, but will do as the Wire and Nail people have done, put their men in the field to get the business, and when this is done factories will create a demand for their goods and the terrible nightmare which they are now having over private brands will have passed away.

Let's see now what is going to become of the little fellow who is at the fork of the creek. This man, as a rule, has only a small capital, and he wants to make it go just as far as he can and earn every cent possible. How can he do this? By buying the least possible quantity of any one article from the small jobber nearest home. In this way he can carry a large assortment in small quantities, sending up to the

At the Fork of the Creek

nearest town in the morning for needed supplies and have the goods on the shelves in the evening. There is no question that he can do just as well in his home market as in a foreign market, and considering all the advantages of his home market decidedly better. The mere fact that branch houses are being established by one of our largest jobbing houses is evidence that these changes are here and are being decidedly felt by the large jobbers. The manufacturer who is slow to see these changes is standing by and looking on while his more wideawake competitor is digging his commercial grave.

DURING the past year the Frankford Chain Works, Frankford, Philadelphia, Pa., which for many years has been engaged in the manufacture of Block Chains solely for use on the well-known Harrington Hoist, installed a Tinius Olsen testing machine and branched out into different lines of high grade Chains, including, Railroad, Cable, Stud Link, Crane, Sling and "F. H. G." Chain from 3-16 to 1¼ inch and special Chains of every description. Three years ago the company's Block Chain business had grown to such proportions that it was compelled to erect its present large and commodious shop. The building was erected not only with the idea of getting out work quickly and economically but also with a view to promoting the comfort and welfare of the com-

pany's employees, the shower baths provided being especially appreciated by the men after their hard day's work at the fire. The company is also licensed tester for the Lloyd's Association and the American Bureau of Shipping.

RESTRICTED PRICES.

LETTERS FROM JOBBING HOUSES.

We have received many letters from jobbing houses in regard to restricted prices and the desirability of their further application in Hardware. From them we make the following extracts:

Favors Rebate System.

To the Editor: As far as we are concerned we would not be in favor of this method of marketing goods being adopted on a general line of Hardware, as we much prefer an open market. We are, however, very much in favor of restricting prices on certain staple lines of goods, with a rebate to be paid in a certain period to jobbers only who have maintained the restricted prices. This method has been adopted, as you no doubt know, on Ice Skates and Ice Cream Freezers, and as far as we know is working most satisfactorily.

It is on such lines, on which the prices have been cut so that there is no profit left for the jobber, that we would like to have restrictions placed by the manufacturer.

The Salvation of the Jobber.

To the Editor: We believe that the consensus of opinion in the jobbing Hardware trade would be in favor of restricted prices on almost everything—in fact, if not everything—in the Hardware line that is carried. The only profitable lines that are handled to-day are those that are controlled by restricted prices, except where special brands are employed, and as manufacturers seem to be fighting special brands it would appear as though the salvation of the jobber lies in restricted prices.

Manufacturers Restricting Prices Would Increase the Value and Popularity of Their Brands.

To the Editor: We believe that the majority of the jobbing trade would favor restricted selling prices on certain lines of goods, not with the idea of eliminating competition in business entirely, but in self protection as against the unbusinesslike and irregular prices made by a certain class of trade, the evolution of the last few years.

This is a matter in which the manufacturer and the distributor, whether wholesaler or retailer, are mutually interested. It is a matter of great concern to the manufacturer that his goods should be popular with the trade through their ability to render a profit to those who handle them, and this particular feature of any line of goods is an asset of the manufacturer the value of which he should carefully guard and maintain. No one is in business for any other object than of realizing a profit, and whenever an article will not afford a profit there is no desire on the part of the distributor to purchase or handle it. This applies not merely to the article itself, but to certain brands, and any line of goods which are handled under protest and considered a necessary evil are avoided whenever possible in favor of something else just as good and more satisfactory to sell. For that reason we consider that the manufacturer is justified in maintaining a minimum selling price for whatever he makes under a brand which he desires advertised and sold.

We think that the restricted prices should apply to a number of the heavy staples, especially seasonable goods, which run largely into money which are carried from one season to another entirely at a loss of interest, and which unfortunately frequently pay a profit entirely too little when we consider capital investment, the expense of handling and the limited sale, except at certain periods of the year. These restricted prices should also apply to such goods the brands of which have an established value, the result of work on the part of the distributor and of merit in their manufacture, and the popularity of which would last indefinitely provided there is co-operation between all in the trade to maintain a just or fair price for the consumer.

The policy of some houses is deeply to be deplored in taking a line of goods or an article, and more for the sake of advertisement, more for the sake of ruining a competitor, to sell such goods at cost, or near to cost, or below cost, until the object desired is obtained, after which their interest in the sale of such goods has dis-

appeared, as has also that of what we might call the legitimate trade.

Practice Illegal in Some Parts of the Country.

To the Editor: We do not favor the plan, and we believe such a practice, if not immoral, in our part of the country certainly is illegal and is not for the best interests of the retail Hardware dealers, and hence is unfavorable to jobbers. It puts a premium upon trickery and is therefore obnoxious to the honest jobber, who has a regard for his honor and plighted word.

Restricted Prices Tend to Localize Business.

To the Editor: As a general thing we think the jobbing trade is opposed to this system. The jobbers prefer to be free to make their own prices and to meet competition as they find it, but on many staple lines the profit has been reduced to such a point that they feel it necessary that some action should be taken which will enable the jobber to make a reasonable margin of profit.

The jobber does not desire prices to be restricted except on such items as are controlled by individual or associated manufacturers. It is desired that just as few items as possible be put on the restricted basis. We think that all jobbers are very well pleased with the present restrictions placed on such goods as Ammunition, Freezers, Revolvers, Guns, Rifles, Skates, &c.

There are only a limited number of items which we think are in such a demoralized condition that it would be desirable to have them placed on a restricted basis. For instance, Poultry Netting and Steel Goods, such as Handled Hoes, Forks, &c.

The Horseshoe proposition has given the Southern jobbers a great deal of worry and annoyance, and an effort has been made to place this item on a restricted basis; but this seems to be impracticable, and we do not suppose any further effort will be made.

We find one class of jobbers who are strongly opposed to restricted prices—viz., the large houses who undertake to cover a large part of the United States and find themselves somewhat handicapped when they are unable to offer any inducements over the local jobber. Then, again, some trouble comes from the small or semijobber, who buys a stipulated quantity in order to obtain the minimum price and resorts to cutting and rebating in order to unload his surplus.

Restricted prices tend to localize the business and place the jobber in position to handle to an advantage the trade adjacent to him.

Might Be Efficacious if Manufacturers Would Enforce Penalties.

To the Editor: The method of restricting prices by paying rebates at the end of the season is one that adds a great deal of work to the bookkeeping force and locks up the profits on the sales for quite a long time.

Another objection to the plan is that it must be done secretly and underhandedly; it would not be popular to let it be known that prices are restricted, for it is a well-known fact that a restriction of prices means an advance as a rule.

Again, the object sought to be obtained—namely, the maintenance of prices—is not accomplished, for in spite of all the restriction put upon prices by the manufacturer there are no end of jobbers who will secretly cut these restricted prices; so that we feel that the plan has not by any means been a success. It has done good in many cases, and would be efficacious if the manufacturers enforced the penalty provided for a violation of the restricted prices.

It is a question whether prices would be more demoralized with an open market than with the restricted price plan. It has worked fairly well with the Ammunition business, but we do not know another single item where prices have not been privately cut by jobbers.

Retailer Could Rely on a Steady Basis of Cost.

To the Editor: As far as our observation goes, and judging from sentiments which we have heard expressed by the jobbers at association meetings and generally indorsed by all jobbers present on such occasions, as a rule they favor restricted prices in the belief that if the same were adopted a certain profit would be insured to them for their compensation and that these prices could be safely adopted by the retailer on a positive or steady basis of cost to him.

The classes of goods to which this could be applied would be preferably the lines that in the past have not paid a reasonable profit, and consequently have been unpopular with the jobber and perhaps have not been carried in stock as largely or in as full a variety as other goods. Consequently this condition has not stimulated sales and has been detrimental alike to the manufacturer and jobber.

TRADE ITEMS.

EICHEL & Co., Richmond, Va., have been appointed selling agents for the product of the High Point Pipe & Foundry Company, manufacturer of Cast Iron Soil Pipe and Fittings. The plant will begin to deliver Pipe about August 1.

L. & I. J. WHITE COMPANY, Buffalo, N. Y., and 43-45 Centre street, New York, has recently erected a large addition to its works, the new structure, which is now in operation, covering a site 135 x 80 feet. The new shops and in a measure the entire works, we are told, have been equipped with the most modern machines and appliances, giving the company a producing capacity of a half more than in the past. The business was established in 1837 and incorporated in 1892, the company making coopers', carpenters' and other Edge Tools, Machine Knives and Dies. A new office has been opened at 1514 Manhattan Building, Chicago, Ill., where the line is shown, and agencies have also been established in many of the principal cities abroad.

THE CANADIAN SHOVEL & TOOL COMPANY, Hamilton, Ont., whose new plant, now being erected, is expected to be capable of turning out finished product by September 1 next, has been admitted to membership in the Canadian Shovel Association. The company's goods will take the same list and discount as the goods made by the other Canadian Shovel manufacturers.

THE EAGLE BICYCLE MFG. COMPANY, Torrington, Conn., has temporarily discontinued the manufacture of Bicycles and is increasing the business of the Progressive Mfg. Company, which is a selling department of the Eagle Company and which manufactures Screws, Rivets, and also devotes special attention to the Eagle Company's recently acquired lines, the Forstner Brace and Machine Bits, which were purchased from the Bridgeport Gun Implement Company. The company's output of Marine Engines will be materially increased and later other lines may be added.

PERRIN, SEAMANS & Co., 57 Oliver street, Boston, Mass., dealers in Construction Tools and supplies, have materially increased the capacity of their quarters by taking over the entire building of which they have heretofore occupied only a part. An increase of stockroom of about one-third of their former floor space has been obtained.

THE IMPERIAL BRASS MFG. COMPANY, 245-247 South Jefferson street, Chicago, has recently doubled the capacity of its plant and added some new machinery to its equipment. It is prepared to accept and turn out promptly considerably larger orders than heretofore for special Hardware required by its customers.

SILVER & Co., 304-314 Hewes street, Brooklyn, N. Y., manufacturers of House Furnishing Goods, Bathroom Fittings and kindred lines, have moved their New York headquarters from 18 Warren street to 99 Chambers street, where a full line of sample goods is displayed for the inspection of buyers.

THE fourth annual meeting of the National Cycle Trade Association, which will be held at the Astor House, New York City, on the 25th and 26th inst., promises to be interesting and well attended. A very efficient committee has made ample provision for the entertainment of the visitors.

NEWMAN CLOCK COMPANY, Chicago, Ill., which made a display at the exhibition at Washington, D. C., held during May last under the auspices of the American Railway Appliance Association in connection with the International Railway Congress, has issued illustrations, one showing the company's exhibit and the other giving a view of the exposition as a whole. The company's pavilion contained a very interesting display of instruments and devices for watchmen, &c., and other mechanical instruments for measuring and controlling time.

THE third annual outing of the Iowa Hardware merchants and traveling salesmen, held at Mason City and Clear Lake on July 13 and 14, proved to be a most enjoyable occasion. Among the special features was a game of baseball between the merchants and the knights of the

grip, a cruise on the beautiful lake and a trap shoot. There were also carriage drives and trolley rides and contests for the girls and boys and ladies, many prizes being given.

THE WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn., and 312 Broadway, New York, is again in a position to execute promptly orders for its Model 1901 ten-gauge lever action repeating Shotgun, which in its present form was brought out in 1901-2, although several improvements have been added since it was first marketed. What at that time was thought to be a two years' supply of this kind of Gun was disposed of in six months.

It is of interest to know that Commander Robert E. Peary, in command of the Arctic ship Roosevelt, which has just sailed in an endeavor to reach the North Pole, took along as part of his mechanical outfit a Tool Cabinet No. 3 complete and a Tool Chest No. 7 complete, both filled with tools of representative American manufacturers, the outfits being supplied by the American Tool Chest Company, 200 West Houston street, New York. This company also equipped the Peary Arctic Expedition of 1898 with a No. 6½ Tool Chest fully supplied with tools.

THE BALDWIN FORGING & TOOL COMPANY.

THE BALDWIN FORGING & TOOL COMPANY, with factories and principal offices at Columbus, Ohio, has been incorporated under the laws of the State of Ohio with a paid up capital stock of \$100,000. The directors and stockholders are Frank M. Baldwin, president and treasurer; John E. Pilcher, vice-president; Frederic M. Black, secretary; R. H. Stockton and Judge Emmet M. Wickham. Mr. Baldwin was formerly vice-president and treasurer of the Chicago Steel Mfg. Company. Mr. Pilcher is widely known in Hardware circles, having been vice-president of the Simmons Hardware Company of St. Louis for a great many years. Mr. Stockton is a prominent manufacturer of St. Louis, being president and treasurer of the Majestic Steel Range Company. The new company will manufacture a full line of Shovels, Spades, Scoops, Post Hole Diggers, Handles of various kinds, Forged Steel Machinist and Screw Wrenches. Its Shovel and Handle departments will be in operation by September 1, it having purchased the Shovel equipment of the J. Mfg. Company, West Manchester, Ohio, and the Hollinger Fence Company, Greenville, Ohio, which will give it a well equipped plant ready to operate. The balance of the plant will be put into operation as rapidly as the machinery can be installed.

AMONG THE HARDWARE TRADE.

Fred. H. Straub is now a member of the Hardware firm of Fred. P. Straub & Co., Evansville, Ind. Mr. Straub has been connected with his father's Hardware business for 18 years and is well equipped by ability and experience to take a prominent part in the management and direction of the firm's large and growing business.

The retail Hardware business of N. H. French at Danbury, Neb., has been purchased by J. L. Sargent.

The Tipton Hardware Company, Tipton, Iowa, has been incorporated for the purpose of doing a general Hardware, Machinery, Plumbing and Metal Working business. The authorized capital is \$25,000. The officers of the company are C. M. Cook, president; A. J. Pearce, vice-president; S. G. Frink, secretary and treasurer.

J. H. Folk, of Hopper & Folk, Bowling Green, Ohio, has sold his interest in the business to J. J. Hopper, who, with his son, will continue under the style of Hopper Hardware Company.

Wallace Holcomb has bought the Hardware and lumber business of Preston Day, Castle Rock, Col.

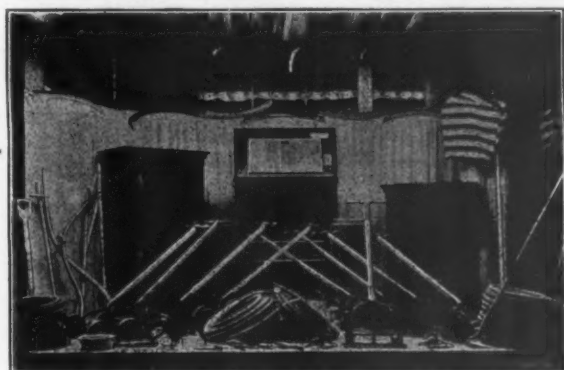
S. I. Rosen, Altus, Ark., has been succeeded in the Hardware and House Furnishing Goods business by S. I. Rosen & Co.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

SPRING GOODS WINDOW EXHIBIT.

E. N. HOWELL HARDWARE COMPANY, Dixon, Ill., whose show windows are always arranged with skill and taste, this method of attracting and sustaining the interest of the public being given special attention, recently prepared the exhibit of spring goods reproduced herewith. The arrangement of the Refrigerators, Steel Goods, Lawn Mowers, Garden Hose, &c., will be recog-



Spring Goods Window Exhibit.

nized as an inviting one, the different articles showing up to advantage and in a manner to commend them to the eye.

FACTS SUPPORTED BY FIGURES.

A MERCHANT in the West presents the facts in regard to catalogue house competition in the following clean-cut, straight from the shoulder style:

THE practice of buying goods of mail order houses is an expensive habit and in the end is a money loser for those who practice it. Let us compare a few methods and prices.

You are obliged to send them your money before you see what you are buying.

You are obliged to buy from pictures and descriptions.

You must pay all freight charges.

In case goods do not suit YOU have the goods, THEY have the money.

It is a well recognized fact that many people will accept merchandise of these catalogue houses without a murmur which they would not accept of local dealers at any price.

For bait they sell you a few staple articles for less money than they can purchase them. But they must and do more than make up on other articles.

Their expenses are enormous. It costs them far more to sell a dollar's worth of goods than it does any average dealer.

Few people realize that it costs one of these houses \$350,000 a year to merely issue their catalogues, and this is surely added to the selling price of the goods.

NOT COUNTING ALL OF THESE THINGS

—the fact that you are hurting the value of your own farm or property when you hurt this town by diverting money; The fact that we take your produce and give you goods in exchange;

The fact that you can get credit when you haven't the ready cash and can always bring goods back and exchange them when they are not satisfactory;

And the fact that you or any of your neighbors who are in hard luck can always get financial help from the local merchants—

In spite of all of these things, if you could get goods cheaper of the mail order houses than of us we would advise you to do it. But you can't do it.

You have a catalogue that you can study in the evenings, and the prices in it look cheap because you have plenty of time to study them and the descriptions are written in fine language.

But if you will take your catalogue and compare prices right through, and if we don't furnish you the same articles, quality considered, cheaper than the mail order house does,

we will give them to you, and you won't be buying anything by a book description, either.

You will see the goods, inspect the quality, and get whatever guarantee there is on them, and if they do not suit you afterward there will be no trouble or risk in exchanging or replacing them.

In support of our statements we quote a few prices for comparison. These prices are all taken from mail order catalogues.

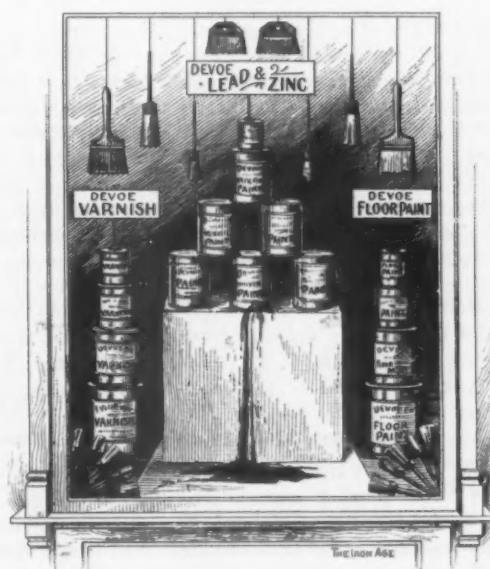
Remember in figuring prices to add to catalogue prices, freight, draft exchange and postage.

Then follows a list of articles, the quality of which is guaranteed equal and in some cases superior to the catalogue house offerings, with parallel columns giving the catalogue house price and the local merchant's price, showing that in nearly all cases the purchaser can actually save money by buying at home, in addition to the other advantages of inspecting the goods, promoting local prosperity, &c.

The statement reproduced above contains many convincing arguments set forth in a terse and impressive manner. It is not an appeal to local pride or mere sentiment, but touches the business instinct of the reader. It makes him pause and consider the wisdom of buying from houses many miles away when better service can be secured from his neighbor. This matter was printed in the form of a page advertisement in the local paper, and proved to be so effective in diverting business to the store that it was subsequently reprinted in the form of a circular and mailed quite freely to the people throughout the territory covered by the establishment.

WINDOW DISPLAY OF PAINTS AND BRUSHES

A WINDOW DISPLAY which proved to be a splendid ad. for Paints and Paint Brushes is reproduced herewith. While the goods were presented in a neat and attractive manner the special feature of the display and the one which arrested so much attention was of course the apparent leak sprung in one of the cans. This effect was secured by opening a small can of red Paint and pouring some of the contents over the window floor and box. The floor was covered with light colored glazed paper so that the Paint would not run through. The box supporting the cans was covered with white paper.



Window Display of Paints and Brushes.

The result was so realistic that during the first two hours after the exhibit was exposed to view nearly 40 persons entered the store to inform the management that one of the Paint cans in the window was leaking, while there was always somebody watching the "leak" during the four or five days that the display remained in the window. The store which was the scene of this exhibit was that of the Wood Hardware Company, Whitehall, N. Y., the idea originating with Mr. Childs, one of the firm's clerks.

SUMMER OUTING OF THE CONNECTICUT HARDWARE ASSOCIATION.

HELD in an ideal spot, under the most favorable weather conditions, with about forty leading firms represented by one or more members, the summer meeting of the Connecticut Hardware Association was an unqualified success. The place selected was the Pequot Hotel, at Morris Cove, near New Haven, and at the happy suggestion of President Agard chairs were placed on the broad veranda, where the members could luxuriate in the cool, fresh breeze blowing off the Sound. Roll call showed about fifty gentlemen present. After the minutes of the last annual meeting were read and approved reports of officers and committees were heard, indicating that all the work of the association was progressing satisfactorily.

President Agard then introduced Secretary James De F. Phelps, the association's delegate to the National Retail Hardware Convention at Minneapolis, who presented an able and enthusiastic report of the convention, which was seconded by A. H. Abbe of New Britain, who is a member of the Executive Committee of the National Association. These gentlemen expressed themselves very appreciatively of the work done by President Bogardus and Secretary Corey on behalf of Hardwaremen throughout the country and voiced the wish that a large number of the Connecticut dealers might share with them the inspiration of the next convention, which is to be held in Chicago.

Name Changed.

At the suggestion of the secretary the name of the association was changed to read Connecticut Hardware Association and a Membership Committee was appointed to take active steps for increasing the enrollment until it included every retailer in the State. This committee consists of A. H. Abbe, New Britain; I. C. Treat, Hartford; J. L. Carroll, Winsted; F. W. Jaynes, Greenwich, and C. H. Preston, Norwich. After general discussion it was voted that the business of the next annual convention be extended over two days so as to give an opportunity for the thorough consideration of all matters properly brought before it, at the same time allowing the members a better opportunity to get acquainted and enjoy each other socially.

Grievances.

There followed an animated discussion of several live questions of the trade, including the catalogue house problem and the action of certain manufacturers in selling their goods to consumers at prices which prevent members of the association from handling trade which they consider rightfully to belong to them. Resolutions presented by Vice-President Geo. J. Bassett of New Haven were unanimously adopted expressing the attitude of the association on these subjects and pledging members to give preference in buying to such concerns as do not sell either consumer or catalogue house. The chair was authorized to appoint a Grievance Committee to which members might refer all complaints for positive action. E. C. Birdsey, Meriden; C. M. Beach, New Milford; J. M. Page, Naugatuck, and S. L. Ewald, New London, were appointed.

Mutual Fire Insurance.

Copies of the *National Hardware Bulletin* were distributed; also printed matter referring to mutual fire insurance for Hardware dealers. The latter project was strongly indorsed by several who had tried it and figures were given showing a saving on insurance of 30 per cent. and more. The theories and practical features of the mutual system were explained in detail and seemed to commend themselves strongly to the judgment of the members.

The business transacted consumed a couple of hours and all were then ready for the shore dinner which was served in the dining room of the hotel. After dinner President Agard, who had an eye to the enjoyment of the company as well as to the business to be transacted, aroused much enthusiasm by the announcement that a steamer was waiting to convey the party across the bay to Savin Rock. Here there were fun and diversion in

plenty and it was with reluctance that one and another gradually broke away to catch the evening trains for home.

Members in Attendance.

The following firms answered the roll call, having one or more representatives present:

J. L. Carroll, Winsted.	N. T. Bushnell Company, New Haven.
Birdsey & Raven, Meriden.	H. L. Mills, New Britain.
H. W. Morse, Meriden.	Smith & Bishel, Middletown.
G. H. Alford, Winsted.	Chas. M. Beach, New Milford.
L. L. Rosenberg & Co., New Haven.	Dickerman Hardware & Supply Company, Wallingford.
G. M. Williams & Co., New London.	F. F. Hitchcock & Son, Woodbury.
John M. Page & Co., Naugatuck.	Hamilton Hardware Corporation, Waterbury.
A. H. & E. W. Abbe, New Britain.	Lyon & Ewald, New London.
Preston Bros., Norwich.	Agard Hardware Company, Torrington.
Dickerman & Pond Company, Winsted.	Tracy, Robinson & Williams Company, Hartford.
F. Hallock & Co., Derby.	John E. Bassett Company, New Haven.
J. S. Davenport & Son, Stamford.	Ralph E. Page, Hartford.
R. D. Wittee, Hartford.	Geo. H. Baker Company, New Haven.
Jaynes Hardware Company, Greenwich.	F. S. Bidwell & Co., Windsor Locks.
Lightbourn & Pond Company, New Haven.	
Clapp & Treat, Hartford.	

CATALOGUE OF FARWELL, OZMUN, KIRK & CO.

A FULL PAGE illustration of the company's new building in process of erection, together with a street plan showing its location in the wholesale district of St. Paul, opens the new edition of Farwell, Ozmun, Kirk & Co.'s catalogue. From a description which follows we learn that the building will be nine stories high and cover an acre of ground. For three stories the walls are of Kettle River sandstone, while the remaining six are of vitrified building brick. Ample trackage facilities are provided, two tracks running the entire length of the structure both inside and outside the walls. The driveway admits of loading and unloading under cover. The building will be equipped with seven electric elevators of large capacity and high speed for freight service. It will also have a complete system of pneumatic tubes with a central station and with receiving and distributing stations on all floors and in all departments.

The new catalogue contains nearly 2000 pages and shows many additions to the line, together with a section of handsome colored pages illustrating the firm's special brands of mechanics' edge tools. An effort has apparently been made to make the volume as complete as possible and afford by illustration and description all necessary and desired information for the convenience of the retail merchant.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM ROGERS & SON, successors in the Hardware business to Myers & Johnson, Reger, Mo.

FROM CHARLES BEED & SON, Hampton, Iowa, merchants in General Hardware, Sporting Goods, Stoves, Furnaces and plumbing.

FROM C. O. HALE, who has opened a retail Hardware store at Sprague, Neb.

FROM LOUIS HIENER, Wheeling, W. Va., who has severed his connection with the Hiener Hardware Company, of which he has been the senior member for the past 12 years, and who has lately opened a store at 1301 and 1303 Market street, where he will conduct the wholesale and retail business in Builders' Hardware, Tools, House Furnishings, Fishing Tackle, &c.

NEW ORLEANS NOTES.

FROM A SPECIAL CORRESPONDENT.

BUILDING Hardware, Builders' Hardware, Interior House Fittings, &c., continue to furnish the main stay of the local Hardware situation, as they have done for the past six weeks or two months. With these lines to maintain the average the total volume of business has been running just the logical and natural amount ahead of what was current in late June and early July of 1904. With an outlook for prosperity in the cotton country better than it was six months ago, and with the cane planters trustful and sanguine of a bountiful crop, the future is painted in rather roseate hues. The tendency of the export and purely local trade to play almost as important a part in the general situation as does the domestic trade to the out of town home markets continues to develop strength.

This is the summary of the situation in a nutshell. There have been many incidents to mark it during the past four weeks, but none of considerable moment. Just now it is vacation time. The working forces are taking turns at the seashore, or "across the lake," as it is termed here. The heads of houses, unless kept here by urgent business, are on their summer tours through the North or the East. Nevertheless, there have been marked developments in increased transportation facilities to domestic and to foreign markets, and there continues to be a perceptible enlargement of the construction work that is looked to to furnish a good local and domestic market for certain lines during the next 18 months at least.

The Lines as They Run.

Implements are just now at the bottom of the ladder, save in the cane belt, where the planters are buying Hauling Tools and are preparing for extensive autumn plowing. Mill Supplies have taken an upward shoot during the past three or four weeks. Extensive repairs and improvements are being made on many plantations where the wear and tear of a big crop have necessitated many changes. These changes are being made because another good crop is in sight. Electrical Installation Supplies and the electrical parts of the intricate machinery used in the new houses are leading other lines, although the simple Mill Supplies are also selling heavily.

The Heavy Hardware and machinery men are all getting good trade from this source. This trade will, of course, continue and rather increase during July, August and early September. Most of the repair work will come on during late August and early September.

Extensive developments in the hard wood and cypress lands have also resulted in the growth of a considerable mill supply demand for the outfitting of new saw mills, stave factories, &c., and also for use in the construction of some projected logging roads.

The leading lines, as said before, are Builders' Hardware, Building Hardware, House Fittings, Furnishings, &c. The same conditions exist here now that did one month ago, with a boom in building and with big contracts yet to be opened. There would seem to be a resuscitation in the domestic, apart from local, demand for these lines, and there are noted the lettings of a number of important building contracts through the larger towns of the neighboring States.

Ship Chandlery will take an upward shoot with the beginning of the winter season. When it is remembered that the number of ships entering New Orleans has almost doubled in the past 18 months any addition to the already developing Chandlery trade is regarded as somewhat of an event. The new dry dock being constructed by the Pearl Wight-Hero group will be ready for business in August and the shipyard to be operated in connection with it will soon be ready for work.

Export Trade.

In my last letter to *The Iron Age* attention was called to the development of the jobbing trade into Cuba and to southern Florida points. The transportation facilities were then just being put into use. Developments during the past four weeks have amply justified the action of the Munson Line in inaugurating service to the northern

and southern Cuban ports outside Havana, while the success of the additional steamer to southern Florida has been phenomenal.

A better condition would seem to exist in regard to Panama trade. While the Hardwaremen of the city now admit that they are not 'getting by any means their proper proportion of the business, they have begun systematic work toward eliminating those factors of the local situation which have militated against them hitherto. Last week Stauffer, Eshleman & Co. received notice that they had succeeded in getting one contract for \$20,000. This was chiefly in Copper Wire, Nettings, Hinges, interior House Fittings, &c. The Heavy Hardwaremen are still being left rather behind and are still making their objections heard as to the methods and customs in vogue here.

Belt Road Celebration.

Saturday, 8th inst., was celebrated the driving of the golden spike that inaugurated the construction work on the Public Belt Railroad that is to encircle the city of New Orleans with a 22-mile railroad run by the city, giving equal service to all. The celebration was made one of the most notable affairs in the business world and was generally accepted as peculiarly significant. The speakers of the occasion dwelt especially on the necessity of bringing factories to the city and to the additional necessity of making the city a center of forwarding warehouses for export trade.

Fairbanks to Build.

The Fairbanks Company is to build a large forwarding warehouse and saleshouse in New Orleans on the Illinois Central belt tracks. The erection of this building means, it is said, that the export business of the firm to the West Indies and Central America will be handled here.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

FLINT & WALLING MFG. COMPANY, Kendallville, Ind.: Booklet entitled "The Proof of the Puddin'," illustrating and describing its Star Wind Mills.

KEYSTONE NAIL COMPANY, Sixteenth street and Washington avenue, Philadelphia, Pa.: Booklet containing price-list of Galvanized Cut and Wire Nails. It is also stated that the company carries a stock of Galvanized Washers, Screws, Rivets, Tacks, &c.

IMPERIAL BRASS MFG. COMPANY, 245-247 South Jefferson street, Chicago: Price-list of Polished Brass Kick Plates, with corrections for Polished Bronze, Lemon Brass, Antique Copper and Sand Blast Antique Copper Finishes.

ASBESTOS SHINGLE, SLATE & SHEATHING COMPANY, Ambler, Pa., 32-page booklet illustrating and describing Asbestos Century Shingles and Asbestos Building Lumber, a composition of Asbestos and Portland Cement.

WEED & Co., Buffalo, N. Y.: New lists on Witherby Chisels and Gouges, Tacks and Set and Cap Screws, for insertion in catalogue.

TALLERDAY STEEL PIPE & TANK COMPANY, Waterloo, Iowa: Illustrated catalogue of Steel Tanks, Culvert Pipe, Sheet Steel Water Pipe, Feed Cookers, Tank Heaters, &c.

WIRE GOODS COMPANY, Worcester, Mass.: Discount sheet No. 23, dated July, 1905, with illustrations of new goods added to its line.

M. EBERHART & SON COMPANY, First avenue and Seventy-sixth street, New York: Illustrated catalogue of imported and domestic specialties, including Noodle Cutters, Bean Cutters, Clippers, Food Choppers, &c.

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R. K. CARTER & CO.

R. K. CARTER & CO., 66 Reade street, New York, who represent in a buying capacity many of the well-known jobbers of Hardware, Iron, Steel and supplies, have, owing to the increasing volume of their business, made some changes in their various departments which will be of interest to the trade at large and which should strengthen materially their efficiency as buyers and without doubt will increase their value to the interests they represent.

W. B. Paulcraft, who for ten years was assistant manager of the old Hardware Buyers' Association, perhaps better known to the trade as the Anvil Club, and who for the past three years was manager of the Pittsburgh office, has been transferred to New York, where he will have special charge of their Hardware buying department and price book system. His extended acquaintance among manufacturers should prove valuable to them in this capacity. George Piper succeeds him as manager of their Pittsburgh office. Mr. Piper's experience in the purchasing department of the Pennsylvania Railroad Company and later as purchasing agent of the American Sewer Pipe Company will be of value in his new relation and doubtless enable him to maintain the high standard of efficiency which has always characterized their Western office. Samuel H. Groser, who was for some ten years with the Hardware purchasing house of Oliver Brothers in a confidential capacity and who enjoys an especially large acquaintance among the Hardware jobbers and jobbing interests of the United States, has just severed his connection with the business department of *The Iron Age* in order to take charge of the special interests of the clients of R. K. Carter & Co. and to visit both them and the manufacturers when occasion requires it.

Alfred C. Greening, as president and treasurer, and Frank R. Blauvelt, as vice-president, will continue the active supervision of the business, as heretofore. This long established house under this energetic and enterprising management and direction, and with the increase of facilities and improvement of method as occasion suggests, is probably better equipped than ever to serve the interests of its large constituency.

MISCELLANEOUS NOTES.

Luggage Carriers.

Megquier & Jones Company, 29-33 Pearl street, Portland, Me., are manufacturers of a comprehensive line of luggage carriers for bicycles. The latest pattern is the Peterson, which differs from the Lamson, longer made by the company, in the manner of attaching to the bicycle. It is fastened to the frame below and independent of the handle bar by means of two leather covered steel hooks, one around the head and one under the horizontal bar of frame, a strap passing around the head holding the carrier firmly and securely in place. A marked feature of this carrier is that it is reversible, so that it can be used on front or rear of machine. The No. 1 is a single carrier with straight shelf for an ordinary package. The No. 2 is a double carrier with 5½-inch drop shelf for carrying two separate bundles. There is also a No. 2, arranged for a lady's wheel. The No. 3 is similar to the No. 2 for men's wheel, but is larger and made of heavier wire for carrying a camera and bundle at the same time independent of each other. This company also makes the well-known Lamson luggage carriers in seven different styles.

New Floor Preparation.

No-Dust, a new floor preparation made like a varnish, is being placed on the market by the manufacturer, Eugene E. Nice, 272-274 South Second Street, Philadelphia, Pa. This material, the maker advises us, will not blacken floors and is a perfectly satisfactory dust preventive. No-Dust can be quickly applied with a mop or large stiff whitewash brush, and for first application about one gallon is required for every 500 to 600 square feet, subsequent applications requiring a less quantity.

Pocket Interchangeable Tool Kit.

Adolph Kastor & Bros., 109 Duane street, New York, are marketing the A. K. & B. interchangeable tool kit here shown. The combination includes a wide range of handy tools for individual and amateur use, not only about home and civilization, but in the woods, camping, shooting or other outings, automobiling, cycling or wherever a person, lay or professional, requires any one of a well assorted number of practical, serviceable tools. The

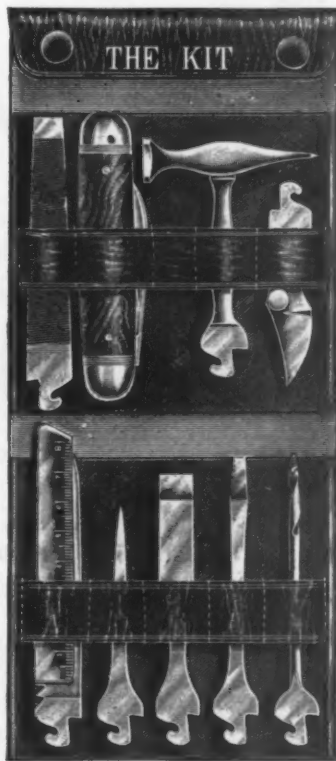


Fig. 1.—A. K. & B. Interchangeable Tool Kit.

knife, which is the foundation of the set, has a stout blade in one end and is fitted at the opposite end to receive any of the various tools. The knife closed is $3\frac{3}{4}$ inches long and its greatest thickness is $\frac{5}{8}$ inch. It has wood scales, brass rivets, strong German silver bolsters and is iron lined. At the tool end is a strong steel rivet for engaging the tang of the various tools, which are sufficiently large to be of practical use, while the ample knife stock furnishes necessary purchase and leverage. When using a tool the slot in the tang is hooked into the end of the knife in a partially closed position (see Fig. 2), when by forcing backward as a knife blade is opened

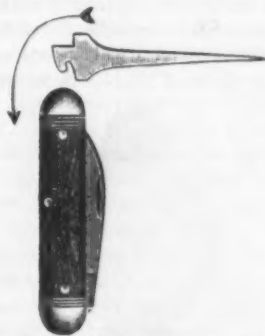


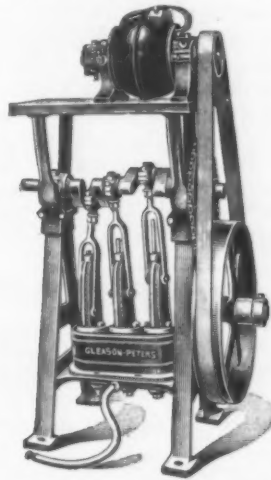
Fig. 2.—Method of Attaching Tools to Handle.

the pressure of the strong steel back spring keeps the tool rigidly in place. The case is of substantial russet leather and when folded is held together by two enameled spring glove buttons. Its dimensions are $4\frac{1}{4} \times 4\frac{1}{4}$ inches, the thickness varying from $\frac{1}{2}$ to 1 inch. The tools are said to be made of best English steel, hand forged, full polished, and are guaranteed. Besides the knife there is a double cut $3\frac{1}{4}$ -inch file, with four filing surfaces, as well as a $\frac{3}{8}$ -inch screw driver blade at the end. Then a tack hammer, with $\frac{5}{8}$ -inch face and tack claw; can opener, $3\frac{1}{2}$ -inch saw, sheathed in a graduated

metallic rule case; reamer, awl and scribe, $\frac{1}{2}$ -inch wood chisel, screw driver, 3-16-inch blade at point, and $\frac{1}{8}$ -inch gimlet. When the file screw driver blade is in position ready for use the tool is 7 inches long over all, and the others are in proportion. Each kit is neatly packed in a telescope paper box $4\frac{1}{2} \times 4\frac{1}{2} \times 1\frac{1}{4}$ inches.

Garage Pump and Motor.

The illustration shows a triple geared cylinder pump made by the Gleason-Peters Air Pump Company, Houston and Mercer streets, New York. The pistons have a direct stroke through a yoke, thus preventing lateral wear, and are connected with the shaft by oscillating forks. While all cylinders force air into the one chamber from which the pipe is fed, the valve in each may readily



Garage Pump and Motor.

be gotten at and changed by unscrewing the nut at the foot without interfering with any other adjustment. A feature of this machine is a superposed platform upon which a motor may be mounted so that the pulley on the motor is directly over the pulley on the pump.

The Bradford Combined Level, Plumb and Inclinator.

Herewith are given illustrations of an instrument offered by the Bradford Union Mfg. Company, Bradford, Pa., which was organized to put it on the market. It is



Fig. 1.—The Bradford Combined Level, Plumb and Inclinator: Wood.

made of aluminum, iron with nickel trim, or mahogany, cherry or white pine. Instead of the larger bulb common to other levels, this instrument has a needle point indicator which registers on a graduated band of 360 degrees, and will give any degree or angle with absolute accuracy. The plumb bob works in bevel shaped polished glass bearing.

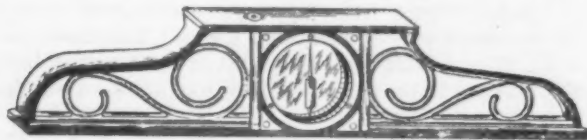


Fig. 2.—The Bradford Combined Level, Plumb and Inclinator: Metal.

ings. It is adjusted and reversible and readable either from top or bottom. Being operated directly from the center of bearing it is free from expansion or contraction and can be used either as level, plumb or inclinometer without any adjustment whatever.

The Simonds Saw Set.

The saw set shown herewith is offered by the Simonds Mfg. Company, Fitchburg, Mass., and 42 Murray street, New York. The principal advantage claimed for this tool lies in the adjustable gauge, which provides for an accurate regulation of the amount of set given to the teeth. Heretofore setting and testing, especially on large sized saws, have required two operations with two differ-



The Simonds Saw Set.

ent tools on each tooth. It was often necessary to spring the tooth and test it several times before the required angle could be secured. With this tool the gauge, consisting of an arm governed by a thumb screw, as indicated, can be adjusted and then applied to each tooth with a certainty of getting an accurate and uniform set in one operation. After the tooth has been grasped in one of the slots and bent over the arm stops against the plane of the saw and prevents further bending when the required set has been obtained. The tool has three different slots to fit saws of varying gauges.

Red Devil Manicure.

The Schatz Hardware & Mfg. Company, Chappaqua, N. Y., represented by the Smith & Hemenway Company, 206 Broadway, New York, has just brought out the Red Devil manicure here shown. The parts are formed from sheet

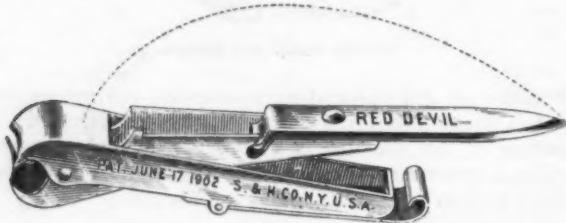


Fig. 1.—Red Devil Nail Clipper, Cleaner and Raiser.

steel. Fig. 1 is actual size, Fig. 2 illustrating the closed position. The device is a combined nail clipper, cleaner, file and cuticle raiser. In use the lever is released by a slight push on the curved end spring and turn of the lever, as seen in Fig. 1, the file being underneath the lever and the cuticle raiser and cleaner on the end. In time, if the spring works too freely, a slight tap forward



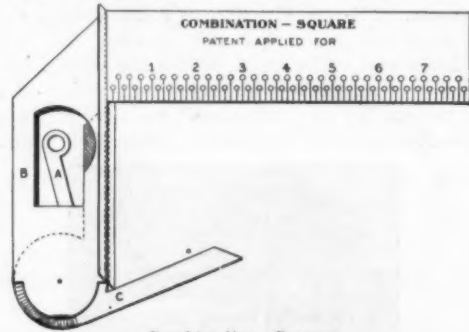
Fig. 2.—Manicure Closed.

will give the proper engagement. The cutting jaws are so formed and ground that a quick can be cut out or hang nail removed, the jaws opening automatically after each downward pressure.

Combination Square.

The Ballard Drop Forge Company, Ballard, Wash., is manufacturing the ingenious combination square shown herewith. It is a well finished instrument, all steel, 18 gauge stock and graduated in eighths of an inch. Perforations in the blade render it practicable as a gauge for any width as well as a miter on a corner. To operate for a given angle or pitch the lever A is moved toward B to fasten sector C. The under side of the disk of sector C is laid off in spaces of 5 degrees each, while the top gives inches from 1 to 12 and from 12 to 1 on the tongue of the square. After the sector is set at the desired angle, indicated by a figure in the left hand series, and applied to a drawing on the tongue line, it is only necessary to reverse the sector to the same figure in the right hand series, turn the square over and it will con-

form to the other line. In other words, the same number on either side of the sector cuts the top and bottom for any brace, rafter, &c. All the combinations of the in-



Combination Square.

strument are available at the same time without alteration.

Bonney's New Climax Pliers.

Bonney, Kraeuter Tool Company, Irvington, N. J., is manufacturing Bonney's New Climax pliers, illustrations of which are here shown. As indicated by Fig. 2, an important feature of this plier is in the peculiarly shaped



Fig. 1.—Bonney's New Climax Pliers.

jaws by means of which tapers and bevels of various angles can be securely gripped; also holding flats and rounds with equal facility. The plier has double compound lever cutters of extra strength, the movable cutting member being of crucible steel, the rest of the plier being made of high grade tool steel. There is also a wire cutter below for cutting up to 1-16 inch. The upper

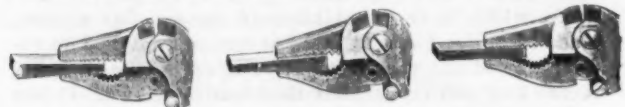
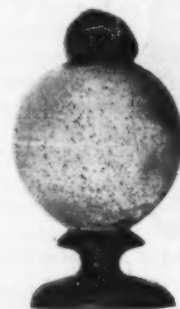


Fig. 2.—Showing Tapers and Straights Gripped.

straight jaw is slotted longitudinally for holding wire of various shapes. The tool is 6½ inches long, has polished jaws and cutter and is finely made.

Dainty Stamp and Envelope Moistener.

We illustrate herewith the Dainty stamp and envelope moistener manufactured by the O'Neill Water Heater Mfg. Company, Peoria, Ill. It consists of a hollow rubber ball, such as is used in plumbing operations, about



Dainty Stamp and Envelope Moistener.

1¾ inches in diameter, secured to a metal pedestal. This ball is filled with water, and a sponge which is furnished with it covers the opening at the top in such a way that the moistener may be inverted at will, the water passing out through the sponge in just sufficient quantity for moistening envelopes or stamps or for wetting the fingers in counting bills, &c. This little novelty is offered at a moderate price.

The Ham Automobile Lamps.

C. T. Ham Mfg. Company, Rochester, N. Y., John H. Graham & Co., general selling agents, 113 Chambers street, New York, is offering the brass lamps shown in the accompanying cuts. The lamp Fig. 1 is 8 inches long,

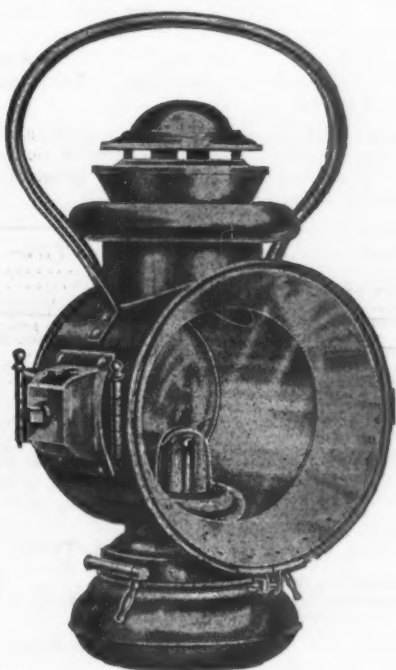


Fig. 1.—Aurora Automobile Lamp.

with front glass 6½ inches in diameter. The lamp is made of brass, securely riveted, and wherever there is an extra strain the parts are strongly reinforced. It is constructed on the cold blast principle and is alluded to as having perfect combustion, as giving a large light, as not smoking or smudging the interior or causing odor and as not sweating the glass or blowing or jarring out. The inspector and tail lamp, Fig. 2, is designed for the use of autoists in looking over machinery, and for this purpose is provided with a rigid handle to make it easy and con-

venient to use when light is need for inspection purposes. Otherwise the lamp is constructed on the same lines and

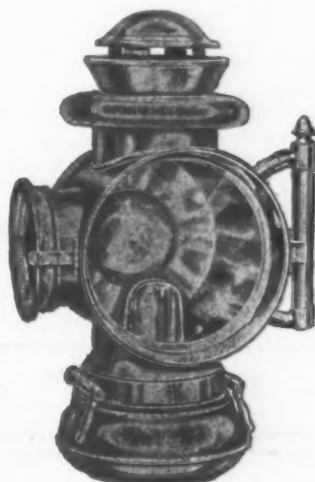


Fig. 2.—Vigilant Inspector and Tail Lamp.

has the same features as the company's side lamps and is constructed on the cold blast principle.

Stamped Cabinet Pull.

The Shelby Spring Hinge Company, Shelby, Ohio, New York office 84-86 Chambers street, is offering the cabinet pull shown herewith two-thirds size. It is made entirely



Stamped Steel Cabinet Pull.

from stamped metal folded up in one piece and is neat in appearance and light in weight. It is for use on fine cabinet work, also for the better class of screen doors. It is made of steel, in ten finishes and in bronze or brass metal, polished, in eight styles of finish.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

Lead, English white, in Oil..	9½ @ 9½
Lead, American white, in Oil:	
Lots of 500 lb or over.....	@ 6½
Lots less than 500 lb.....	@ 7
In Barrels.....	@ 6
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	@ ½
Lead, White, in oil, 12½ lb tin	
pails, add to keg price.....	@ 1
Lead, White, in oil, 1 to 5 lb	
ass'ted tins, add to keg price..	@ 1½
Lead, American, Terms: For lots 12	
tons and over ¼¢ rebate; and 2% for	
cash if paid in 15 days from date of	
invoice; for lots of 500 lbs. and over	
2% for cash if paid in 15 days from	
date of invoice, for lots of less than	
500 lbs. net.....	@ 1
Lead, White, Dry in bbls.....	@ 6
Zinc, American, dry.....	4½ @ 4½
Zinc, French:	
Paris, Red Seal, dry.....	8½
Paris, Green Seal, dry.....	9½
Antwerp, Red Seal, dry.....	7½
Antwerp, Green Seal, dry.....	8½
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over.....	11½ @ 12½
Lots of less than 1 ton.....	11½ @ 12½
Zinc, V. M. French, in Poppy Oil:	
Lots of 1 ton and over.....	10½ @ 10½
Lots of less than 1 ton.....	10½ @ 11½
Discounts—French Zinc—Discounts	
to buyers of 10 bbl. lots of one or mixed	
grades, 1%; 25 bbls., 2%; 50 bbls., 4%.	

Dry Colors—

Black, Carbon.....	5 @ 10
Black, Drop, Amer.....	4 @ 6
Black, Drop, Eng.....	5 @ 6
Black, Ivory.....	5 @ 15
Lamp, Com.....	4½ @ 6
Blue, Celestial.....	4 @ 6
Blue, Chinese.....	29 @ 32
Blue, Prussian.....	27 @ 30
Blue, Ultramarine.....	4½ @ 15
Brown, Spanish.....	¾ @ 1
Carmine, No. 40.....	3½ @ 3.00
Green, Chrome, ordinary.....	3½ @ 6

Green, Chrome, pure.....	17 @ 25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over.....	@ 6½
Lots less than 500 lb.....	@ 7
Litharge, American, bbls.....	@ 6½
Ocher, American.....	¥ ton \$3.50 @ 16.00
Orcher, American Golden.....	2¼ @ 3½
Orcher, French.....	1¼ @ 2½
Orcher, Foreign Golden.....	3 @ 4
Orange Mineral, English.....	8 @ 10
Orange Mineral, French.....	10½ @ 11½
Orange Mineral, German.....	1¼ @ 10
Orange Mineral, American.....	9 @ 8¼
Red, Indian, English.....	4½ @ 8¼
Red, Indian, American.....	3 @ 3½
Red, Turkey, English.....	4 @ 10
Red, Tuscan, English.....	7 @ 10
Red, Venetian, Amer.....	¥ 100 lb \$0.50 @ 1.25
Red Venetian, English.....	100 lb \$1.15 @ 1.75
Sienna, Italian, Burnt and	
Powdered.....	3 @ 9½
Sienna, Ital., Raw, Powd.....	3 @ 6½
Sienna, American, Raw.....	1¼ @ 2
Sienna, American, Burnt and	
Powdered.....	1¼ @ 2
Talc, French.....	¥ ton \$15.00 @ 30.00
Talc, American.....	¥ ton 15.00 @ 25.00
Terra Alba, French.....	¥ 100 lb 90 @ 1.00
Terra Alba, English.....	¥ 100 lb 90 @ 1.00
Terra Alba, American.....	¥ 100
Terra Alba, American.....	¥ 100
B. No. 2.....	60 @ 70
B. No. 2.....	45 @ 60
Umber, T'key, But. & Pow.....	2¼ @ 3½
Umber, Turkey, Raw & Pow.....	2¼ @ 3½
Umber, Burnt, Amer.....	1¼ @ 2
Umber, Raw, Amer.....	1¼ @ 2
Yellow, Chrome.....	11 @ 14
Vermilion, American Lead.....	10 @ 25
Vermilion, Quicksilver, bulk.....	@ 65
Vermilion, Quicksilver, bags.....	@ 66
Vermilion, English, Import.....	75 @ 80
Vermilion, Chinese.....	\$0.90 @ 1.00

Colors in Oil—

Black, Lampblack.....	12 @ 14
Blue, Chinese.....	26 @ 46
Blue, Chinese.....	26 @ 46
Blue, Prussian.....	27 @ 30
Blue, Ultramarine.....	13 @ 16
Brown, Vandyke.....	11 @ 14
Green, Chrome.....	10 @ 15
Green, Paris.....	24 @ 24

Sienna, Raw.....	12 @ 15
Sienna, Burnt.....	12 @ 15
Umber, Raw.....	11 @ 14
Umber, Burnt.....	11 @ 14

Miscellaneous—

Barytes, White, Foreign.....	¥ ton \$17.50 @ 19.00
Barytes, Amer. floated.....	¥ ton 18.00 @ 19.00
Barytes, Crude, No. 1.....	¥ ton 10.00 @ 11.00
Chalk, in bulk.....	¥ ton 3.00 @ 3.25
Chalk, in bbls.....	¥ 100 lb .40 @ .35
China Clay, English.....	¥ ton 11.00 @ 17.00
Cobalt, Oxide.....	¥ 100 lb 2.50 @ 2.60
Whiting, Common.....	¥ 100 lb .43 @ .48
Whiting, Gilders.....	¥ 100 lb .50 @ .55
Whiting, Ex. Gilders.....	¥ 100 lb .55 @ .60

Putty, Commercial—¥ 100 lb

In bladders.....	\$1.75 @ 1.80
In bbls. or tubes.....	1.10 @ 1.15
In 1 lb to 5 lb cans.....	2.05 @ 2.95
In 12½ to 50 lb cans.....	1.45 @ 1.60

Spirits Turpentine—¥ gal.

In Oil bbls.....	60½ @ 61
In machine bbls.....	61 @ 61½

Glue—

Cabinet.....	11 @ 15
Common Bone.....	7 @ 9
Extra White.....	18 @ 24
Foot Stock, White.....	11 @ 14
Foot Stock, Brown.....	8 @ 11
French.....	12 @ 18
Irish.....	13 @ 16
Low Grade.....	9 @ 12
Medium White.....	14 @ 17

Gum Shellac—

Bleached Commercial.....	33 @ 35
Bone Dried.....	43 @ 45
Button.....	26 @ 45
Diamond I.....	50 @ 52
Fine Orange.....	43 @ 45
A. C. Garnet.....	35 @ 36
D. C.....	65 @ 66
Octagon B.....	@ 46
T. N.....	39 @ 40
V. S. O.....	30 @ 31

Animal, Fish and Vegetable Oils—¥ gal.

Linseed, City, raw.....	51 @ 52
Linseed, City, boiled.....	53 @ 54
Linseed, State and West'n raw.....	49 @ 51
Linseed, raw Calcutta seed.....	@ 60
Lard, Prime, Winter.....	56 @ 58
Lard, Extra No. 1.....	47 @ 48
Lard, No. 1.....	35 @ 39
Cotton-seed, Crude, f.o.b. mills.....	22½ @ 23½
Cotton-seed, Summer Yellow,	
Prime.....	28 @ 29½
Cotton-seed, Summer Yellow,	
off grades.....	@ 29½
Sperm, Crude.....	55 @ 56
Sperm, Natural Spring.....	@ 57
Sperm, Bleached Spring.....	@ 58
Sperm, Natural Winter.....	60 @ 63
Sperm, Bleached Winter.....	63 @ 65
Tallow, Prime.....	51 @ 53
Whale, Crude.....	@ 54
Whale, Natural Winter.....	42 @ 44
Whale, Bleached Winter.....	44 @ 46
Menhaden, Brown, Strained.....	28 @ 29
Menhaden, Light, Strained.....	29 @ 30
Menhaden, Bleached, Winter.....	31 @ 32
Menhaden, Ex-Bld. Winter.....	32 @ 33
Menhaden, Southern.....	16½ @ 17
Cocanut, Ceylon.....	¥ lb 6¼ @ 6½
Cocanut, Coch.....	¥ lb 7¼ @ 7½
Cod, Domestic, Prime.....	34 @ 36
Cod, Newfoundland.....	35 @ 41
Red Elaine.....	31 @ 32
Red, Sapouised.....	¥ lb 4 @ 4½
Olive, Italian, bbls.....	53 @ 57
Neatsfoot, prime.....	49 @ 50
Palm, Logos.....	¥ lb 5½ @ 5½

Mineral Oils—

Black, 29 gravity, 25 @ 30 cold ¥ gal,	
test.....	10¼ @ 11¼
Black, 29 gravity, 15 cold test.....	11¼ @ 12¼
Black, Summes.....	10¼ @ 11¼
Cylinder, light filtered.....	18 @ 19
Cylinder, dark filtered.....	18 @ 17
Paraffine, 903-907 gravity.....	12¼ @ 13
Paraffine, 903 gravity.....	11¼ @ 12
Paraffine, 883 gravity.....	9¼ @ 9½
Paraffine, Red.....	11¼ @ 13
In small lots ¼¢ advance.	

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 1/2 @ 33 1/2 & 10% signifies

that the price of the goods in question ranges from 33 1/2 per cent. discount to 33 1/2 and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, \varnothing doz. \$3.00.....33 1/2
North's.....10
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35
Taplin's Perfection.....35

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils..... \varnothing doz. \$10.00
Hay-Budden, Wrought..... \varnothing doz. \$10.00
Horseshoe brand, Wrought..... \varnothing doz. \$10.00
Trenton..... \varnothing doz. \$10.00

Imported—

Peter Wright & Sons..... \varnothing doz. \$10.00
Anvil, Vise and Drill—
Millers Falls Co., \$18.00.....15 & 10%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—
Livingston Nail Co.....33 1/2

Augers and Bits—

Com. Double Spur.....70 & 10 @ 75
Jennings' Patn. reg. Finish.....50 & 10
Boring Mach. Augers.....70 & 10
Car Bits, 12-in. twist.....50 & 10
Ford's Auger and Car Bits.....40 & 5
Foster's Pat. Auger Bits.....25
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list.....25
No. 30, R. Jennings' list.....40 & 1 1/2
Russell Jennings.....25 & 10 & 1 1/2
L. Hommedieu's Car Bits.....45
Mayhew's Countersink Bits.....45
Millers Falls.....50 & 10 & 1 1/2
Ohio Tool Co.'s Bailey Auger and Car Bits.....40 & 10
Pugh's Black.....20
Pugh's Jennings' Pattern.....20
Snell's Auger Bits.....30
Snell's Bell Hangers Bits.....30
Snell's Car Bits, 12-in. twist.....60 & 10
Wright's Jennings' Bits.....50

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—
Clark's small, \$18; large, \$26.....50 & 10
Clark's Pattern, No. 1, \varnothing doz. \$26.....50 & 10
No. 2, \$18.....50 & 10
Ford's, Clark's Pattern.....50 & 10
C. E. Jennings & Co., Steer's Pat.....25
Swan's.....60

Gimlet Bits— Per doz.
Common Dble. Cut.....\$3.00 @ \$3.25
German Pattern, Nos. 1 to 10.....\$4.80; 11 to 13, \$5.75

Hollow Augers—
Bonney Pat., per doz. \$9.00 @ 10.00
Ames.....25 & 10
New Patent.....25 & 10
Universal.....25 & 10
Wood's Universal.....25

Ship Augers and Bits—
Ford's.....33 1/2 @ 35
C. E. Jennings & Co.:
L. Hommedieu's.....15
Watrous.....35 & 5
Ohio Tool Co.'s.....40
Snell's.....45

Awl Hatts—See Hatts, Axl.

Awls—
Handled.....gro. \$2.75 @ \$3.00
Unhanded, Shlided.....gro. \$3 @ \$3.25
Unhanded, Patent.....gro. \$3 @ \$3.25

Peg Awls—
Unhanded, Patent.....gro. \$1 @ \$1.25
Unhanded, Shlided.....gro. \$1 @ \$1.25
Scratch Awls:
Handled, Com.....gro. \$3.50 @ \$4.00
Handled, Socket.....gro. \$11.50 @ \$12.00
Hurwood.....40%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—
Single Bit, base weights:
First Quality.....\$6.75
Second Quality.....\$6.25
Double Bit, base weights:
First Quality.....\$8.75
Second Quality.....\$8.25

Axle Grease—
See Grease, Axle

Axles—
Iron or Steel
Concord, Loose Collar.....1 1/2 @ 1 1/2
Concord, Solid Collar.....1 1/2 @ 1 1/2

No. 1 Common, Loose.....3 1/2 @ 3 1/2
No. 1 1/2 Com., New Style.....4 1/2 @ 4 1/2
No. 2 Solid Collar.....4 1/2 @ 4 1/2
Nos. 7, 8, 11 and 12.....75 @ 75 & 5
Nos. 13 to 14.....70 & 10 @ 75 & 5
Nos. 15 to 18.....75 & 10 @ 75 & 10 & 5
Nos. 19 to 22.....75 & 10 @ 75 & 10 & 5

Boxes, Axle—

Common and Concord, not turned
lb. 1 1/2 @ 1 1/2
Common and Concord, turned,
lb. 5 1/2 @ 5 1/2
Half Patent.....lb. 8 1/2 @ 9

Bait— Fishing—

Hendryx:
A Bait.....20
B Bait.....20
Competitor Bait.....20 & 5

Balances— Sash—

Caldwell new list.....50
Pullman.....50 & 10 @ 60

Spring—

Spring Balances.....40 @ 60 & 5
Chatillon's:
Light Spg. Balances.....40 & 10
Straight Balances.....50
Circular Balances.....50
Large Dial.....30

Barb Wire—See Wire, Barb.

Bars— Crow—

Steel Crowbars, 10 to 40 lb.
per lb., 2 1/2 @ 3 1/2

Towel—

No. 10 Ideal, Nickel Plate..... \varnothing gro. \$8.50

Beams, Scale—

Scale Beams.....40 & 10 @ 50
Chatillon's No. 1.....30
Chatillon's No. 2.....40

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered \varnothing doz. \$0.85;
Tinned.....\$1.00
No. 11 Wire Coppered \varnothing doz. \$1.10;
Tinned.....\$1.20
No. 10 Wire Galvanized..... \varnothing doz. \$1.75
Western W. G. Co.:
No. 2 Electric..... \varnothing gro. \$7.80
No. 2 Buffalo..... \varnothing gro. \$9.00
No. 3 Perfection Dust..... \varnothing gro. \$8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned..... \varnothing doz. \$1.20
Holt, No. 1, Tinned..... \varnothing doz. \$1.50
Holt, No. B, Japanned..... \varnothing doz. \$2.00
Holt, No. 2, Tinned..... \varnothing doz. \$2.25
Lyon, No. 2, Japanned..... \varnothing doz. \$1.25
Lyon, No. 3, Japanned..... \varnothing doz. \$1.50
Taplin Mfg. Co.:
No. 60 Improved Dover..... \varnothing gro. \$8.00
No. 75 Improved Dover.....\$6.50
No. 100 Improved Dover.....\$7.00
No. 102 Improved Dover, Tin'd.....\$8.50
No. 150 Improved Dover, Hotel.....\$15.00
No. 152 Imp'd Dover, Hotel, T'd.....\$17.00
No. 200 Imp'd Dover Tumbler.....\$8.50
No. 202 Imp'd Dover Tumbler, T'd.....\$8.50
No. 300 Imp'd Dover Mammoth.....\$25.00
doz. 80%
Western W. G. Co., Buffalo.....\$7.00
Wonder (S. S. & Co.), \varnothing gro. net, \$8.00

Bellows—

Blacksmith, Standard List.....60 & 10 @ 70 & 10

Hand—

Inch.....6 7 8 9 10
Doz.....\$4.50 5.00 5.50 6.00 6.50

Molders—

Inch.....9 10 11 12 14
Doz.....\$8.00 9.00 10.50 12.50 14.50

Bells— Cow—

Ordinary goods.....75 & 5 @ 75 & 10 & 5
High grade.....70 & 10 @ 70 & 10 & 5
Jersey.....75 & 10
Texas Star.....50%

Door—

Abbe's Gong.....45
Burton Gong.....50
Home, R. & S. Mfg. Co.'s.....55 & 10
Lever and Fall, Sargent's.....60 & 10 & 15
Trip Gong.....50 & 10 @ 50 & 10 & 5
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.....60 & 5 @ 60 & 10 & 5
Nickel Plated.....50 & 10 @ 50 & 10 & 5
Swiss.....60 @ 60 & 7 1/2

Cone's Globe Hand Bells.....33 1/2 @ 35
Silver Chime.....33 1/2 @ 35

Miscellaneous—

Farm Bells.....lb. 2 1/2 @
Steel Alloy Church and School.....50 & 10 @ 60 & 5
American Tube & Stamping Co.
Gongs.....75
Table Call Bells.....50 & 10

Belting— Leather—

Extra Heavy, Short Lap.....60 & 5 @ 60 & 5
Regular Short Lap.....65 & 10 @ 70
Standard.....70 & 5 @ 70 & 10
Light Standard.....70 & 10 @ 75
Cut Leather Lacing.....60 & 10
Leather Lacing Sides, per sq. ft.
17 1/2 @ 18 1/2

Rubber—

Agricultural (Low Grade).....75 @ 75 & 5
Common Standard.....70 @ 70 & 10
Standard.....65 & 70
Extra.....60 & 5 @ 60 & 10
High Grade.....50 & 5 @ 50 & 10

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters.....20
Detroit Stockard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain.....50
Parts.....50
Spokes.....50
Tubes.....60

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks— Tackle—

Common Wooden.....70 & 10 @ 75 & 5
Hartz St. Tackle Blocks.....50 @ 50 & 5
Hollow Steel Blocks, with Ford's Patent Sheaves.....50 & 10
Lane's Patent Automatic Lock and Junior.....30
Stowell's Novelty, Mal. Iron.....50 & 10
Stowell's Self Loading.....60
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....30 & 19 @ 40 & 10

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....30 & 5

Boils—

Carriage, Machine, &c.—
Common Carriage (cut thread):
3/4 x 6 and smaller.....75 & 10
Larger and longer.....70 & 7 1/2
Phila. Eagle \$3.00 list May 24, '99

Bolt Ends, list Feb. 14, '95.....70 & 2 1/2
Machine, 3/4 x 4 and smaller.....75 & 2 1/2
Machine, larger and longer.....70 & 5

Door and Shutter—

Cast Iron Barrel, Japanned,
Round Brass Knob:
Inch.....3 4 5 6 8
Per doz. \$0.30 .35 .45 .56 .75

Cast Iron Spring Foot, Jap'd:
Inch.....6 8 10
Per doz.....\$1.15 1.40 2.00

Cast Iron Chain, Flat, Japanned:
Inch.....6 8 10
Per doz.....\$0.95 1.25 1.55

Cast Iron Shutter, Japanned,
Brass Knobs:
Inch.....6 8 10
Per doz.....\$0.80 .90 1.20

Wrt. Barrel Jap'd.....80 @ 80 & 10
Wrt. "Bronzed.....50 @ 50 & 10
Wrt. Spring.....70 & 10 @ 70 & 10 & 10
Wrt. Shutter.....60 & 5 @ 50 & 10 & 5
Wrt. Square Neck.....75 @ 75 & 10
Wrt. Square.....65 & 10 @ 65 & 10 & 10
Ives' Patent Door.....60

Plow and Stove—

Plow.....65 & 10 @ 65 & 10 & 10
Stove.....82 1/2 @ 10 @ 82 1/2 @ 10 & 5

Tire—

Common.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82 1/2
Bay State, list Dec. 23, '99.....80%

Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82 1/2
Eclipse, list Dec. 23, '99.....80%

Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82 1/2
Mount Carmel, list Dec. 23, '99.....80%

Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 23, '99.....80%
Norway Phila., list Oct., '84.....80%

Upon Nut Co.:
Tire Bolts.....72 1/2

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch.....1 1/4 1 1/2 1 3/4 2
Per doz.....\$4.80 5.60 6.40 8.00

Inch.....2 1/4 2 1/2 2 3/4 3
Per doz.....\$6.65 11.50
Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30
Langdon.....15 & 10
Perfection..... \varnothing doz. \$30.00
Schatz.....40
Stanley R. & L. Co.:
Nos. 240 to 400.....30
Nos. 50 and 60.....35

Braces—

Common Ball, American.....\$1.25 @ 1.50
Barber's.....50 & 10 @ 60 & 10
Fray's Genuine Spofford's.....60
Fray's No. 70 to 130, 81 to 125, 207 to 415.....60

C. E. Jennings & Co.....50 & 5
Mayhew's Ratchet.....60
Mayhew's Quick Action Hay Pat.....50
Millers Falls Drill Braces.....25 & 10
P. S. & W. Co., Peck's Pat. 60 & 10 @ 65
Stanley R. & L. Co.:
Stanley.....35
Victor.....45

Brackets—

Wrought Steel.....80 & 10 @ 80 & 10 & 5
Bradley's Wire Shelf.....80 & 10 @ 85
Griffin's Pressed Steel.....80 & 10 @ 85
Griffin's Folding Brackets.....70 & 10
Stowell's Cast Shelf.....75
Stowell's Sink.....50
Western W. G. Co., Wire.....60 & 10

Bright Wire Goods—

See Wire and Wire Goods.

Broilers—

Kilbourne Mfg. Co.....75 & 20
Western W. G. Co.....80
Wire Goods Co.....70 @ 75 & 10

Buckets, Galvanized—

Price per dozen,
Quart.....19 12 14
Water, Regular.....1.40 1.70 1.90
Water, Heavy.....3.40 3.70 3.80
Fire, Hd. Bottom.....2.80 2.55 2.95
Well.....2.55 2.87 3.15

Bucks, Saw—

Hoosier..... \varnothing gro. \$36.00

Bull Rings—See Rings, Bull

Butts— Brass—

Wrought, list Sept., '96.....30
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....40 & 10 @ 50
Fast Joint, Narrow.....40 & 10 @ 50
Loose Joint.....70 & 10 @ 75
Loose Pin.....70 & 10 @ 75
Mayer's Hinges.....70 & 70 & 5
Parliament Butts.....70 & 70 & 5

Wrought Steel—

Table and Back Flaps.....75
Narrow and Broad.....75
Inside Blind.....75
Loose Pin.....75
Loose Pin, Jap'd.....70 & 10
Loose Pin, Ball and Steeple
Tipped.....85
Japanned Ball Tip Butts.....70 & 10

Bronzed, Wrt., Nar. and Inside Blind Butts.....55 & 10

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....30 & 10
200, 300, 600 and 900 series.....60 & 10

Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Banneled.....40&10%

Calipers—See *Compasses*.
Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4¢
Sharp, 1 prong.....per lb. 4¢
Gautier, Blunt.....1/2 doz. 3.65¢
Perkins, Blunt Toe.....1/2 doz. 3.65¢
Perkins, Sharp Toe.....1/2 doz. 4.15¢

Can Openers—
See *Openers, Can*.
Cans, Milk—

5 8 10 gal.
Illinois Pattern.....\$1.35 1.85 2.35 each.
New York Pattern.....1.50 2.20 2.45 each.
Baltimore Pattern.....1.50 2.20 2.45 each.
Baltimore Pattern.....1.50 2.20 2.45 each.
Baltimore Pattern.....1.50 2.20 2.45 each.

Cans, Oil—
Buffalo Family Oil Cans:
\$13.00 60.00 120.00 gro., net.

Caps, Percussion—
Eley's E. B.5¢
G. D.per M 34¢
F. L.per M 40¢
G. E.per M 48¢
Musketper M 62¢

Primers—
Berdan Primers, 2¢ per M.....30%
B. L. Caps (Sturtevant Shells)
2¢ per M.....30%
All other primers per M \$1.52@1.70

Cartridges—
Blank Cartridges:
32 C. F.10¢
38 C. F.10¢
22 cal. Rim.10¢
22 cal. Rim.10¢
B. B. Caps, Con. Ball.10¢
B. B. Caps, Round Ball.10¢
Central Fire.10¢
Target and Sporting Rifle.10¢
Primed Shells and Bullets.10¢
Rim Fire, Sporting.10¢
Rim Fire, Military.10¢

Castors—
Bed70¢
Plate60¢
Philadelphia75¢
Acme, Ball Bearing.33¢
Boss Anti-Friction.70¢
Boss (Roller Bearing).80¢
Martin's Patent (Phoenix).45¢
Standard Ball Bearing.45¢
Tucker's Patent low list.30¢
Yale (Double Wheel) low list.50¢

Cattle Leaders—
See *Leaders, Cattle*.
Chain, Coil—

American Coil, Straight Link:
3-16 3/4 5-16 3/4 7-16 3/4 9-16 3/4
\$7.50 5.35 4.40 3.70 3.55 3.45 3.40
3/4 3/4 3/4 1 to 1 1/4 in. lb.
\$3.35 3.30 3.25 3.25 per 100 lb.
German Coil60¢
Cattle Chain60¢

Halters and Ties—
Halter Chains.60¢
German Pattern Halter Chains,
list July 24, '97.60¢
Cow Ties.60¢

Trace, Wagon, &c.—
Traces, Western Standard: 100 pr.
6 1/2-6 3/4, Straight, with ring. \$23.50
6 1/2-6 3/4, Straight, with ring. \$24.50
6 1/2-6 3/4, Straight, with ring. \$28.00
6 1/2-6 3/4, Straight, with ring. \$32.00
NOTE: Add 3¢ per pair for Hooks.
Tie Traces 30¢ per pair higher than
Straight Link.

Miscellaneous—
Jack Chain, list July 10, '93:
Iron60¢
Brass60¢
Safety Chain75¢
Gal. Pump Chainlb. 5¢
Covert Mfg. Co.:
Breast35¢
Halter35¢
Heel35¢
Rein35¢
Stallion35¢
Covert Sad. Works:
Breast70¢
Halter70¢
Hold Back70¢
Rein70¢
Onida Community:
Am. Coll and Halters.40¢
Am. Cow Ties.45¢
Eureka Coll and Halter.45¢
Niagara Coll and Halter.45¢
Niagara Cow Ties.45¢
Niagara Wire Dog Chains.45¢
Wire Goods Co.:
Dog Chain70¢
Universal Pbl. Jointed Chain.50¢

Chalk—(From Jobbers).
Carpenters' Blue.gro. 35¢
Carpenters' Red.gro. 30¢
Carpenters' White.gro. 25¢
See also Crayons.

Checks, Door—
Bardley's45¢
Columbia50¢
Eclipse60¢

Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools.35¢
Gentlemen's Chests, with Tools.35¢
Farmers' Chests, with Tools.35¢
Machinists' and Pipe Fitters'
Chests, Empty.50¢
Tool Cabinets.50¢
E. Jennings & Co.'s Machine
Tool Chests.35¢

Chisels—
Socket Framing and Firmer
Standard List.....75¢
Buck Bros.30¢
Charles Buck Co. Socket Firmer
C. E. Jennings & Co. Socket Framing
No. 10.....60¢
C. E. Jennings & Co. Socket Framing
No. 15.....60¢
Ohio Tool Co.'s.....70¢
Swan's.....70¢
L. & I. J. White.....30¢

Tanged—
Tanged Firmers. \$3 1-3@3 1-3@10%
Buck Bros.30¢
Charles Buck Co. Socket Firmer
C. E. Jennings & Co. Nos. 191, 181, 25
L. & I. J. White, Tanged.....25¢

Cold—
Cold Chisels, good quality. 13¢
Cold Chisels, fair quality. 11¢
Cold Chisels, ordinary. 9¢

Chucks—
Beach Pat. each \$8.00.....35¢
Empire25¢
Blacksmiths25¢
Jacobs' Drill Chucks.....35¢
Pratt's Positive Drive.....25¢
Skinner Patent Chucks.....50¢
Independent Lathe Chucks.....50¢
Universal50¢
Combination50¢
Drill Chucks, New Model.....30¢
Drill Chucks, Standard.....45¢
Drill Chuck, Skinner Pat., 9, 1, 2, 30
Duck Chucks, Skinner Pat., 3, 4
5, 6, 7, 8.....35¢
Drill Chucks, Positive Drive.....30¢
Planer Chucks.....25¢
Face Plate Jaws.....40¢
Standard Tool Co.:
Improved Drill Chuck.....45¢
Union Mfg. Co.:
Combination50¢
Czar Drill.....35¢
Combination Geared Scroll.....40¢
Geared Scroll.....40¢
Independent45¢
Union Drill.....45¢
Universal50¢
Independent Iron F. Plate Jaws. 40¢
Independent Steel F. Plate Jaws. 40¢
Westcott Patent Chucks:
Lathe Chucks.....50¢
Little Giant Auxiliary Drill.....50¢
Little Giant Double Grip Drill.....50¢
Little Giant Drill, Improved.....50¢
Onida Drill.....50¢
Scroll Combination Lathe.....50¢

Clamps—
Adjustable, Hammers.....20¢
Cabinet, Sargent's.....50¢
Carriage Makers, P. S. & W. Co. 50¢
Carriage Makers, Sargent's.....60¢
Besly, Parallel.....35¢
Lineman's, Utica Drop Forge & Tool
Co.40¢
Saw Clamps, see Vises, Saw Filers.

Cleaners, Drain—
Iwan's Champion, Adjustable.....55¢
Iwan's Champion, Stationary.....45¢

Sidewalk—
Star Socket, All Steel.....\$4.05 net
Star Shank, All Steel.....\$3.35 net
W. & C. Shank, All Steel.....\$3.00 net
7 1/4 in., \$3.00; 8 in., \$3.25.

Cleavers, Butchers'—
Foster Bros.30¢
New Haven Edge Tool Co.45¢
Fayette R. Plumb.....35¢
L. & I. J. White.....30¢

Clippers—
Chicago Flexible Shaft Company:
98 Chicago Horse.....\$8.75 15%
1902 Chicago Horse.....10.75 20%
20th Century Horse, each. 45.00 20%
Lightning Belt.....\$15.00 15%
Chicago Belt.....\$12.75 20%
Independent Patent Sheep.....20%
Finger Nail Clippers
Smith & Hemenway Co. 1/2 doz. net \$2.00

Clips, Axle—
Eagle, 5-16 and 3/4 in. 75¢
Norway, 5-16 and 3/4 in. 60¢

Cloth and Netting, Wire—
See *Wire, &c.*

Cocks, Brass—
Compression, Plain Bibbs,
Globe, Kerosene, Racking,
&c., Cocks.....70¢

Coffee Mills—
See *Mills, Coffee*.

Collars, Dog—
Nickel Chain, Walter B. Stevens &
Son's list.....40¢
Leather, Walter B. Stevens & Son's
list.....40¢

Combs, Curry—
Metal Stamping Co.....40%

Mane and Tail—
Covert's Saddlery Works.....60¢

Compasses, Dividers, &c.—
Ordinary Goods.....75¢
Bemis & Call Hdw. & Tool Co.:
Dividers.....65¢
Callipers, Double.....65¢
Callipers, Inside or Outside.....65¢
Callipers, Wing.....65¢
Compasses.....65¢

Conductor Pipe—
L. C. L. to Dealers:
Galvanized.

Territory—
Nestled, Not nested.
Eastern.....70¢
Central.....70¢
Southern.....70¢
So. Western.....60¢

Copper—
Eastern.....50¢
Central.....50¢
Southern.....50¢
So. Western.....50¢

Terms—
60 days; 25 cash 10 days.
Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—
Gal, each. 2 3 4 6 8
Labrador.....\$1.20 \$1.50 \$1.80 \$2.10 \$2.70
Gal.....3 4 6 8 10
Inland, ea. \$1.80 \$2.10 \$2.40 \$3.00
Gal.....3 4 6 8 10
Galv. Lined, ea. \$1.85 \$2.00 \$2.25 \$2.90 \$3.90
25%

Galv. Lined, side handles,
Gal. 2 3 4 6 8
Each. \$1.95 \$2.15 \$2.40 \$3.30 \$4.15 25%

Coopers' Tools—
See *Tools, Coopers'*.

Cord—
Sash—
Braided, Drab.....lb. 35¢
Braided, White, Com. lb. 22¢
Cable Laid Italian.....lb. 18¢

Common India.....lb. 18¢
Cotton Sash Cord, Twisted. 11¢
Patent Russia.....lb. 14¢
Cable Laid Russia.....lb. 14¢
India Hemp, Braided.....lb. 18¢
India Hemp, Twisted.....lb. 18¢
Patent India, Twisted.....lb. 18¢
Anniston Cordage Co.: Braided Cotton.
Old Glory, Nos. 7 to 12.....lb. 25¢
Anniston, Nos. 8 to 12, 23¢; No. 7,
23 1/2¢; No. 6, 24 1/2¢.

Anniston Drab, Nos. 7 to 12, lb. 25¢
Anniston Mahogany.....27¢
Pearl Braided, cotton, No. 6, lb. 23 1/2¢
No. 7, 22 1/2¢; No. 8, 22¢; No. 9, 22¢
Eddystone Braided, Nos. 7, 8, 9 and
10.....lb. 24¢
Eddystone Braided Cotton, No. 6.....lb. 25¢
Harmony Cable Laid Italian, Nos. 7
to 10.....lb. 23¢
Peerless:
Cable Laid Italian.....18¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton.....lb. 40¢
Braided, Italian Hemp.....lb. 40¢
Braided, Linen.....lb. 55¢
Braided, White Cotton or Spot.....lb. 35¢
Massachusetts, White.....lb. 28¢
Massachusetts, Drab.....lb. 35¢
Phoenix, White, Nos. 8 to 12, 24¢
No. 7, 24 1/2¢; No. 6, 25 1/2¢.

Silver Lake:
A quality, Drab.....40¢
A quality, White.....35¢
B quality, White.....30¢
Italian Hemp.....40¢
Linen.....57 1/2¢

Wire, Picture—
List Oct., '00.....85¢
Hendryx Standard Wire Picture Co.85¢

Cradles—
Grain40¢

Crayons—
White Round Crayons, gr. 5¢
Cases, 100 gro., \$4.00, at factory.
D. M. Steward Mfg. Co.:
Jumbo Crayons.....gr. 3.50
Metal Workers' Crayons, gr. 2.50
Soapstone Pencils, round, flat
or square.....gr. 1.50
Rolling Mill Crayons.....gr. 2.50
Railroad Crayons (composition)
gr. 2.00

Zelnicke's Lumber:
Red, Blue, Green.....gr. 36.50
Black.....gr. 40.00
See also Chalk.

Crooks, Shepherds'—
Fort Madison, Heavy.....1/2 doz. \$7.00
Fort Madison, Light.....1/2 doz. \$6.50

Crow Bars—See *Bars, Crow*.

Cultivators—
Victor Garden.....50%

Cutlery, Table—
International Silver Company:
No. 12 M'dm Knives, 1847.....1/2 doz. \$3.50
Star, Eagle, Rogers & Hamilton
and Anchor.....1/2 doz. \$3.00
Wm. Rogers & Son.....1/2 doz. \$2.50

Cutters—
Glass—
H. H. Mayhew Co.....40¢
Red Devil.....50¢
Smith & Hemenway Co.....50¢
Woodward.....40%

Meat and Food—
American.....30%
Nos. 1 2 3 4 5
Each.....\$5 \$7 \$10 \$25 \$50 \$60
Enterprise.....25¢
Nos. 6 10 12 22 32
Each.....\$2 \$3 \$2.75 \$4.50 \$6
Dixon's.....1/2 doz. 30¢
Nos. 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Ideal.....40¢
Little Giant.....1/2 doz. 33¢
Nos. 305 310 312 320 322
Each.....\$3.00 \$4.00 \$4.00 \$7.00 \$8.00
N. E. Food Choppers.....40¢
New Triumph No. 605, 1/2 doz. \$24.00
30¢
Ruswin Food, No. 1, \$21.00; No. 2,
\$27.00.....45¢
Woodruff's.....1/2 doz. 30¢
Nos. 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200
Enterprise Beef Shavers.....25¢

Slaw and Kraut—
Henry Diaston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 24 x 7, 26 x 8, 30
x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12.....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.....1/2 doz. \$3.00
Combined Slaw Cutter and Corn
Grater.....1/2 doz. \$4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife.....1/2 gr. \$18¢
Slaw Cutters, 2 Knife.....1/2 gr. \$22¢

Tobacco—
All Iron, Cheap.....\$4.25@4.50
Enterprise.....25¢
National, 1/2 doz. No. 1, \$21; No. 2,
\$18.....40%
Sargent's, 1/2 doz. No. 2.....60¢
Sargent's, Nos. 12 and 21.....60¢

Washer—
Appleton's, 1/2 doz., \$16.00.....50¢

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger, per doz. \$9.00
Iwan's Imp'ed Post Hole Auger 40¢
Iwan's Vaughan Pattern Post Hole
Augers.....1/2 doz. \$6.25
Iwan's Perfection Post Hole Digger.....1/2 doz. \$8.25
Iwan's Split Handle Post Hole Dig-
gers.....1/2 doz. \$7.25
Kohler's Universal.....1/2 doz. \$15.00
Kohler's Little Giant.....1/2 doz. \$12.00
Kohler's Hercules.....1/2 doz. \$10.00
Kohler's Invincible.....1/2 doz. \$9.00
Kohler's Rival.....1/2 doz. \$8.00
Kohler's Pioneer.....1/2 doz. \$7.20
Never-Break Post Hole Diggers.....1/2 doz. \$24.00
Samson, 1/2 doz. \$34.00

Dividers—See *Compasses*.

Doors, Screen—
Phillips', style E, 3/4 in.....1/2 doz. \$10.00
Phillips', style 077, 3/4 in.....1/2 doz. \$7.50
Phillips', style x-y, 3/4 in.....1/2 doz. \$10.50

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, 1/2
doz., \$18; No. 2, \$15; No. 3, \$12;
No. 4, \$18.

Drawing Knives—
See *Knives, Drawing*.

Dressers, Emery Wheel—
Diamond Emery Wheel Dressers.....35%
Diamond Wheel Dresser Cutters.....35%

Drills and Drill Stocks—
Common Blacksmiths' Drill,
each.....\$1.50@1.75
Breast, Millers Falls.....15¢
Breast, P. S. & W.....40¢
Goodell Automatic Drills, 40¢
Johnson's Automatic Drills, Nos.
1 and 2.....15¢
Johnson's Drill Points.....15¢
Millers Falls Automatic Drills, 33¢
Ratchet, Curtis & Curtis.....25¢
Ratchet, Parker's.....40¢
Ratchet, Weston's.....35¢
Ratchet, Whitney's, P. S. & W.....35¢
Whitney's Hand Drill, No. 1, \$10.00
Adjustable, No. 10, \$12.00.....35%

Twist Drills—
Bit Stock.....60¢
Taper and Straight Shank.....60¢

Drivers, Screw—
Screw Driver Bits, per doz. \$5.00
Balsey's Screw Holder and Driver.....1/2 doz. 2 1/2 in. \$4; 4 in. \$7.50; 6 in. \$9
Buck Bros.' Screw Driver Bits.....30¢
Champion.....50¢
Edison.....60¢
Pray's Hol. H'dle Sets, No. 3, \$12.50
Gay's Double Action Ratchets.....35¢
Goodell's Auto.....\$6.00
Hurwood.....40¢
Mayhew's Black Handle.....40¢
Mayhew's Monarch.....40¢
Millers Falls, Nos. 20 and 21.....25¢
Millers Falls, No. 11, 12, 41, 42, 15¢
Never Turn.....60¢
New England Specialty Co.....50¢
Sargent & Co.:
Nos. 1 and 60.....50¢
Nos. 50 and 55.....60¢
Nos. 20 and 40.....70¢
Smith & Hemenway Co.....40¢
H. D. Smith & Co.'s Perfect H'dle. 40¢
Stanley R. & L. Co.:
No. 64, Varn. Handles.....55¢
No. 86.....75¢
Victor.....70¢
Defiance.....70¢
Swan's:
Nos. 65 to 68.....50¢
No. 40.....40¢
Nos. 25, 35 and 45.....20¢

Eave Trough, Galvanized—
Territory. L. C. L.
Eastern.....80¢
Central.....75¢
Southern.....75¢
So. Western.....75¢
Terms—25¢ for cash. Factory ship-
ments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—
Factory shipments, all territories:
Galv. Steel and Galv. C. C.
Iron and Steel, Standard
Gauge.....60¢
No. 26.....35¢
No. 21.....25¢
No. 22.....10¢
Copper.....37 1/2¢
Perfect Elbows (S. & Co.).....40%

Emery, Turkish—
Kegs.....10¢
1 1/2 Kegs.....10¢
1 1/2 Kegs.....10¢
1 1/2 Kegs.....10¢
10-lb. cans.....10¢
10 in case.....6 1/2¢
10-lb. cans, less
than 10.....10¢
Less quantity.....10¢
NOTE—In lots 1 to 3 tons a discount
of 10% is given.

Extractors, Lemon Juice—
See *Squeezers, Lemon*.

Fasteners, Blind—
Zimmerman's.....50¢
Walling's.....45%

Cord and Weight—
Ives.....40%

Faucets—	
Cork Lined.....	50¢ to 1.00
Metallic Key, Leather Lined.....	60¢ to 1.00
Red Cedar.....	40¢ to 1.00
Petroleum.....	70¢ to 1.00
B. & L. B. Co.:.....	60¢ to 1.00
Star.....	50¢ to 1.00
West Lock.....	50¢ to 1.00
John Sommer's Peerless Tin Key.....	50¢ to 1.00
John Sommer's Boss Tin Key.....	50¢ to 1.00
John Sommer's Victor Mil. Key.....	50¢ to 1.00
John Sommer's Duplex Metal Key.....	50¢ to 1.00
John Sommer's Diamond Lock.....	50¢ to 1.00
John Sommer's I. X. L. Cork Lined.....	50¢ to 1.00
John Sommer's Reliable Cork Lined.....	50¢ to 1.00

John Sommer's Chicago Cork Lined.....	50¢ to 1.00
John Sommer's O. K. Cork Lined.....	50¢ to 1.00
John Sommer's No Brand, Cedar.....	50¢ to 1.00
John Sommer's Perfection, Cedar.....	50¢ to 1.00
McKenna, Brass.....	50¢ to 1.00
Burglar Proof, N. P.....	50¢ to 1.00
Improved, 1/2 and 1 inch.....	50¢ to 1.00
Self Measuring.....	50¢ to 1.00
Enterprise, 1/2 doz. \$36.00.....	40¢ to 1.00
Lane's, 1/2 doz. \$36.00.....	40¢ to 1.00
National Measuring, 1/2 doz. \$36.00.....	40¢ to 1.00

Felloe Plates—	
See Plates, Felloe.	

Files— Domestic—	
List revised Nov. 1, 1899.	
Best Brands.....	70¢ to 1.00
Standard Brands.....	75¢ to 1.00
Lower Grade.....	75¢ to 1.00

Imported—	
Stubs' Tapers, Stubs' List, July 21, '97.....	33 1-3 to 40%

Fixtures, Fire Door—	
Richards Mfg. Co.:.....	\$4.00
Universal, No. 103.....	\$4.00
Special, No. 104.....	\$4.00
Fusible Links.....	\$0.25
Expansion Bolts.....	50¢ to 1.00

Grindstone—	
Net Prices:	
Inch.....	15 17 19 21 23
Per doz.....	2.15 2.35 2.55 2.75 2.95
P. S. & W. Co.:.....	30¢ to 1.00
Reading Hardware Co.:.....	30¢ to 1.00
Sargent's.....	70¢ to 1.00
Stowell's Giant Grindstone Hanger.....	1/2 doz. \$5.00
Stowell's Grindstone Fixtures.....	50¢ to 1.00
Stowell's Grindstone Fixtures, Light.....	50¢ to 1.00

Fodder Squeezers—	
See Compressors.	

Forks—	
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.	
Iowa Dig-Easy Potato.....	60¢ to 1.00
Victor, Hay.....	60¢ to 1.00
Victor, Manure.....	60¢ to 1.00
Victor, Header.....	60¢ to 1.00
Champion, Hay.....	60¢ to 1.00
Champion, Header.....	60¢ to 1.00
Champion, Manure.....	60¢ to 1.00
Columbia, Hay.....	60¢ to 1.00
Columbia, Manure.....	60¢ to 1.00
Columbia, Spading.....	60¢ to 1.00
Hawkeye Wood Barley.....	60¢ to 1.00
W. & C. Potato Digger.....	60¢ to 1.00
Acme Hay.....	60¢ to 1.00
Acme Manure, 4 tine.....	60¢ to 1.00
Dakota Header.....	60¢ to 1.00
Jackson Steel Barley.....	60¢ to 1.00
Kansas Header.....	60¢ to 1.00
W. & C. Favorite Wood Barley.....	60¢ to 1.00
Plated.—See Spoons.	

Frames— Saw—	
White, 8' x 1' Bar, per doz. 75¢ to 80¢	
Red, 8' x 1' Bar, per doz. \$1.00 to 1.25	
Red, Dbl. Brace, per doz. \$1.40 to 1.50	

Freezers, Ice Cream—	
Qt.	1 2 3 4 6
Each	\$1.30 \$1.60 \$1.90 \$2.20 \$2.50

Fruit and Jelly Presses—	
See Presses, Fruit and Jelly.	

Fry Pans—See Pans, Fry.	
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Fuse— Per 1000 Feet.	
Hemp	\$2.75
Cotton	3.20
Waterproof Sgl. Taped.....	3.65
Waterproof Dbl. Taped.....	4.40
Waterproof Tpl. Taped.....	5.15

Gates, Molasses and Oil—	
Stebbins' Pattern.....	80¢ to 1.00

Gauges—	
Marking, Mortise, do.....	50¢ to 1.00
Chapin-Stephens Co.:.....	50¢ to 1.00
Marking, Mortise, do.....	50¢ to 1.00
Scholl's Patent.....	50¢ to 1.00
Door Hangers.....	50¢ to 1.00
Stanley R. & L. Co.'s Butt and Rabbit Gauge.....	50¢ to 1.00
Marking and Mortise.....	50¢ to 1.00
Wire, Brown & Sharpe's.....	50¢ to 1.00
Wire, Morse's.....	50¢ to 1.00
Wire, P. S. & W. Co.:.....	50¢ to 1.00

Gimlets— Single Cut—	
Numbered assortments, per gro.	
Nail, Metal, No. 1, \$2.00; 2, \$2.30	
Spike, Metal, No. 1, \$4.00; 2, \$4.30	
Nail, Wood Handled, No. 1, \$2.30; 2, \$2.60	
Spike, Wood Handled, No. 1, \$4.30; 2, \$4.60	

Glass, American Window—	
See Trade Report.	

Glasses, Level—	
Chapin-Stephens Co.:.....	60¢ to 1.00

Glue, Liquid Fish—	
Bottles or Cans, with Brush.....	

Cans (1/2 pts., pts., qts., 1/2 gal., gal.).....	25¢ to 1.00
International Glue Co. (Martin's).....	40¢ to 1.00

Grease, Axle—	
Common Grade.....	40¢ to 1.00
Dixon's Everlasting, 10-lb pails, ea. 85¢	
Dixon's Everlasting, in boxes, 2 doz. 1 lb., \$1.20; 2 doz. 2 lb., \$2.00	
Helmet Hard Oil.....	50¢ to 1.00

Grips, Nipple—	
Perfect Nipple Grips.....	40¢ to 1.00

Griddles, Soapstone—	
Pike Mfg. Co.:.....	33¢ to 40¢

Grindstones—	
Bicycle Emery Grinder.....	\$4.50
Bicycle Grindstones, each.....	\$2.50 to \$3.50
Pike Mfg. Co.:.....	33¢ to 40¢
Improved Family Grindstones.....	25¢ to 30¢
per inch, 1/2 doz. \$2.00	
Pike Mower and Tool Grinder.....	50¢ to 1.00
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....	\$3.25

Halters and Ties—	
Covert Mfg. Co.:.....	35¢ to 45¢
Web.....	35¢ to 45¢
Rope.....	30¢ to 40¢
Cotton Rope.....	45¢ to 55¢
Hemp Rope.....	45¢ to 55¢
Covert's Saddle Works.....	70¢ to 80¢
Web and Leather Halters.....	70¢ to 80¢
Jute and Manila Rope Halters.....	70¢ to 80¢
Sisal Rope Halters.....	60¢ to 70¢
Jute, Manila and Cotton Rope Ties.....	70¢ to 80¢
Sisal Rope Ties.....	60¢ to 70¢
E. T. Bug & Co.:.....	50¢ to 60¢
Leather Halters.....	50¢ to 60¢
Web Halters and Webbing.....	60¢ to 70¢
Jute and Sisal Rope Halters.....	60¢ to 70¢
Jute and Sisal Horse and Cattle Ties.....	60¢ to 70¢
Cotton Horse Ties.....	60¢ to 70¢
Livery Ties, Braided.....	60¢ to 70¢

Hammers—	
Handled Hammers—	
Heller's Machinists.....	40¢ to 1.00
Heller's Farriers.....	40¢ to 1.00
Magnetic Tack, Nos. 1, 2, 3, \$1.25, \$1.50, \$1.75.....	50¢ to 1.00
Peck, Stow & Wilcox.....	40¢ to 1.00
Fayerly R. Plumb.....	33¢ to 40¢
Plumb, A. E. Nail.....	33¢ to 40¢
Engineers' and R. S. Hand.....	50¢ to 1.00
Machinists' Hammers.....	50¢ to 1.00
Riveting and Tinner's.....	40¢ to 1.00
Sargent's C. S. New List.....	40¢ to 1.00

Heavy Hammers and Sledges—	
Under 3 lb., per lb. 50¢.....	80¢ to 1.00
3 to 5 lb., per lb. 40¢.....	80¢ to 1.00
Over 5 lb., per lb. 30¢.....	80¢ to 1.00
Wilkinson's Smiths'.....	1 lb. 9¢ to 10¢

Handles—	
Agricultural Tool Handles	
Axe, Pick, do.....	60¢ to 1.00
Hoe, Rake, do.....	45¢ to 50¢
Fork, Shovel, Spade, do.....	45¢ to 50¢
Long Handles.....	45¢ to 50¢
D Handles.....	40¢ to 50¢

Cross-Cut Saw Handles—	
Atkins.....	40¢ to 50¢
Champion.....	40¢ to 50¢
Dixson's.....	40¢ to 50¢

Mechanics' Tool Handles—	
Auger, assorted.....	20¢ to 30¢
Brad Axl.....	10¢ to 20¢
Chisel Handles.....	10¢ to 20¢
Apple Tanged Firmer, gro. assorted.....	\$2.40 to \$2.65
Hickory Tanged Firmer, gro. assorted.....	\$2.15 to \$2.40
Apple Socket Firmer, gro. assorted.....	\$1.75 to \$1.95
Hickory Socket Firmer, gro. assorted.....	\$1.45 to \$1.60
Hickory Socket Framing, gro. assorted.....	\$1.60 to \$1.75
Pile, assorted.....	10¢ to 20¢
Hammer, Hatchet, Axc. do.....	60¢ to 1.00

Web and Leather Halters.....	70%
Jute and Manila Rope Halters....	70%
Sisal Rope Halters.....	60 & 20%
Jute, Manila and Cotton Rope	

Hangers—	
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, do.	
Barn Door, New Pattern, Round Groove, Regular:	
Inch.....	3 4 5 6 8
Single Doz.....	\$0.90 1.25 1.50 1.75 2.50

Barn Door, New England Pattern, Check Back, Regular:	
Inch.....	3 4 5 6
Single Doz.....	\$1.30 1.85 2.50 3.00

Allith Mfg. Co.:.....	
Reliable, No. 1.....	per doz. \$8.00
Chicago Spring Butt Co.:.....	per doz. \$9.00

Friction.....	25¢
Oscillating.....	25¢
Big Twin.....	25¢

Chisholm & Moore Mfg. Co.:.....	
Baggage Car Door.....	50¢
Elevator.....	50¢
Railroad.....	50¢

Cronk & Carrier Mfg. Co.:.....	
Loose Axle.....	60¢ to 1.00
Roller Bearing.....	70¢ to 80¢

Griffin Mfg. Co.:.....	
Solid Axle, No. 10, \$12.00.....	70¢
Roller Bearing, No. 11, \$15.00.....	70¢
Roller Bearing, Ex. Hy., No. 22, \$18.00.....	70¢

Hinged Hangers, \$16.00.....	
Lawrence Bros.:.....	60¢ to 1.00
Advance.....	60¢ to 1.00
Clarence.....	60¢ to 1.00
Clipper, No. 75.....	60¢ to 1.00
Crown.....	60¢ to 1.00
Easy Parlor Door, Dbl. Sets, \$2.50; Single Sets, \$1.25.....	60¢ to 1.00

Giant.....	
Hummer.....	70¢ to 80¢
New York.....	60¢ to 1.00
Peerless.....	70¢ to 80¢
Sterling.....	60¢ to 1.00

McKinney Mfg. Co.:.....	
No. 1, Special, \$15.....	60¢ to 1.00
No. 2, Standard, \$18.....	60¢ to 1.00
Hinged Hangers, \$16.....	60¢ to 1.00
Meyers' Stayon Hangers.....	60¢ to 1.00

Richards Mfg. Co.:.....	
Pioneer Wood Track No. 3, \$2.15	
Roller B'r'g St'l Track No. 10, \$2.40	
Roller B'r'g St'l Track No. 12, \$2.30	
Roller B'r'g St'l Track No. 13, \$2.40	
Roller B'r'g St'l Track No. 14, \$2.30	
Hero, Adj. Track No. 19.....	50¢
Adjustable Track Tandem Trol.....	40¢ to 50¢
Seal, Steel Track No. 8, \$2.40	
Auto Adj. Track No. 22, \$4.00.....	40¢ to 50¢
Trolley B. D. No. 17.....	\$1.40
Trolley F. D. No. 120.....	\$2.35
Trolley F. D. No. 121.....	\$2.45
Trolley F. D. No. 150.....	\$2.60
Safety Underwriters F. D., No. 101.....	\$2.25
Tandem No. 44.....	70¢ to 80¢
Trolley F. D. No. 151.....	\$3.00
Palace, Adjustable Track No. 135.....	40¢ to 50¢
Royal, Adjustable Track No. 122.....	40¢ to 50¢

Ives' Wood Track No. 1.....	
Trolley B. D. No. 20.....	\$1.35
Trolley B. D. No. 21.....	\$1.45
Trolley B. D. No. 27.....	\$1.50
Trolley B. D. No. 28.....	\$1.60
Roller Bearings No. 39, 40, 41.....	70¢ to 80¢
Anti-friction No. 42.....	60¢ to 70¢
Hinged Tandem No. 48.....	60¢ to 70¢
Folding Door B. B. Swivel No. 137.....	60¢ to 70¢

Safety Door Hanger Co.:.....	
Storm King Safety.....	60¢ to 70¢
U. S. Standard Hinge.....	60¢ to 70¢

Stowell Mfg. & Foundry Co.:.....	
Acme Parlor Ball Bearing.....	40¢
Apex Parlor Door.....	50¢ to 1.00
Atlas.....	60¢ to 70¢
Baggage Car Door.....	50¢
Climax Anti-Friction.....	50¢ to 1.00
Elevator.....	50¢ to 1.00
Freight Car Door.....	60¢ to 70¢
Interstate.....	60¢ to 70¢
Lundy Parlor Door.....	50¢ to 1.00
Magic.....	60¢ to 70¢
Matchless.....	60¢ to 70¢
Nansen.....	50¢ to 1.00
Parlor Door.....	50¢ to 1.00
Railroad.....	50¢ to 1.00
Refr. Hinge Door.....	50¢ to 1.00
Street Car Door.....	50¢ to 1.00
Steel, No. 300.....	50¢ to 1.00
Underwriters' Fire Door.....	40¢ to 50¢
Wild West Warehouse Door.....	40¢ to 50¢
Zenith for Wood Track.....	50¢ to 1.00

A. L. Sweet Iron Works:	
Check Back.....	70¢ to 80¢
Climax Anti-Friction.....	50¢ to 1.00
Eagle.....	60¢ to 70¢
Hylo Hinge.....	60¢ to 70¢
New Perfection.....	60¢ to 70¢
Pilot.....	60¢ to 70¢
Pilot Hinge.....	60¢ to 70¢
Rider Woooster.....	60¢ to 70¢
Western Pattern.....	70¢ to 80¢

Taylor & Boggs F'y Co.'s Kidder's Roller Bearing.....	
Wilcox Mfg. Co.:.....	60¢ to 1.00
Bike Roller Bearing.....	60¢ to 1.00
C. T. Roller Bearing.....	60¢ to 1.00
Cycle Ball Bearing.....	60¢ to 1.00
Dwarf Ball Bearing.....	60¢ to 1.00
Ives' Wood Track.....	60¢ to 1.00
L. T. Roller Bearing.....	60¢ to 1.00
New Era Roller Bearing.....	60¢ to 1.00
O. T. Roller Bearing.....	60¢ to 1.00
Prindle Wood Track.....	60¢ to 1.00
Richards' Steel Track.....	60¢ to 1.00
Spencer Roller Bearing.....	60¢ to 1.00
Tandem, Nos. 1 and 2.....	60¢ to 1.00
Underwriters' Roller Bearing.....	60¢ to 1.00
Velvet.....	60¢ to 1.00
Wilcox Auditorium Ball B'r'g.....	60¢ to 1.00
Wilcox Barn Trolley No. 125.....	40¢ to 50¢
Wilcox Elv. Door, Nos. 112 and 122.....	50¢ to 60¢
Wilcox Fire Trolley, No. 40.....	60¢ to 70¢
Wilcox Fire Trolley, No. 41.....	60¢ to 70¢
Wilcox Le Roy Noiseless Ball Bearing.....	60¢ to 1.00
Wilcox New Century.....	50¢ to 1.00
Wilcox O. K. Steel Track.....	50¢ to 1.00
Wilcox O. K. Trolley.....	50¢ to 1.0

Wrought Iron Hinges— Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges.....	70¢
Heavy Strap Hinges.....	75¢
Light T Hinges.....	65¢
Heavy T Hinges.....	60¢
Extra Heavy T Hinges.....	70¢
Hinge Hasps.....	50¢
Cor. Heavy Strap.....	75¢
Cor. Extra Heavy T.....	70¢

Screw Hook.....	6 to 12 in. 1b. 3½¢
and Strap.....	13 to 20 in. 1b. 3½¢
	22 to 36 in. 1b. 3¢

3/4 to 1 inch.....	1b. 6¢
1/2-inch.....	1b. 7¢
1/4-inch.....	1b. 9¢

Hitchers, Stall—	
Covert Mfg. Co., Stall Hitchers.....	35¢

Hods— Coal—	
Inch.....	15 16 17 18
Galv. Open.....	\$2.50 2.75 3.00 3.25
Jap. Open.....	\$1.90 2.10 2.35 2.55
Galv. Funnel.....	\$3.00 3.30 3.60 3.90
Jap. Funnel.....	\$2.45 2.65 2.85 3.30

Masons, Etc.—	
Cleveland Wire Spring Co.:	
Steel Mortar, No. 13.....	each \$1.25
Steel Brick, No. 162.....	each \$0.95

Hoes— Eye—	
Scovill and Oral Pattern.....	60¢
Grub, list Feb. 23, 1899.....	70¢
D. & H. Scovill.....	36¢

Handled—	
NOTE—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.	
Cronk's Weeding No. 1, \$2.00; No. 2, \$2.25	
Ft. Madison Cotton Hoe.....	70¢
Ft. Madison Crescent Cultivator Hoe.....	70¢
Ft. Madison Mattock Hoe.....	70¢
Regular Weight.....	66¢
Junior Size.....	40¢
Ft. Madison Sprouting Hoe.....	50¢
Ft. Madison Dixie Tobacco Hoe.....	70¢
Kretzinger's Cut Easy.....	70¢
Warren Hoe.....	70¢
W. & C. Ivanhoe.....	70¢
B. B. 6 in. Cultivator Hoe.....	70¢
B. B. 6 in. in.....	70¢
Acme Weeding.....	70¢
W. & C. Lining Shovel Hoe.....	70¢

Hoisting Apparatus—	
See Machines, Hoisting.	

Holders— Bit—	
Angular, 1/2 doz. \$24.00.....	45¢

Door—	
Bardsley's.....	45¢
Empire.....	50¢
Pullman.....	50¢

File and Tool—	
Nicholson File Holders and File	
Handles.....	35¢

Fruit Jar—	
Triumph Fruit Jar Holder, 1/2 gross, \$10.80; 1/2 doz. \$1.25	

Hooks—Cast Iron—	
Bird Cage, Reading.....	40¢
Bird Cage, Sargent's List.....	60¢
Ceiling, Sargent's List.....	60¢
Clothes Line, Reading List.....	40¢
Clothes Line, Sargent's List.....	50¢
Clothes and Hat, Sargent's List.....	50¢
Clothes Line, Stowell's.....	70¢
Coat and Hat, Reading.....	45¢
Coat and Hat, Stowell's.....	70¢
Coat and Hat, Wrightsville.....	65¢
Harness, Reading List.....	80¢
Harness, Stowell's.....	80¢
School House, Stowell's.....	70¢

Wire—	
Wire C. & H. Hooks.....	80¢
Atlas, Coat and Hat.....	75¢
Bradley Metal Clasp Coat and Hat.....	75¢
Columbian Hdw. Co., Gem.....	60¢
Parker Wire Goods Co., King.....	75¢
Van Wagner, Coat and Hat.....	70¢
Western W. G. Co., Molding.....	70¢
Wire Goods.....	60¢
Chief.....	70¢
Crown.....	70¢
Czar.....	60¢
V. Brace.....	70¢
Czar Harness.....	80¢

Wrought Iron	
Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$2.50.	
Cotton.....	10¢
Wrought Staples, Hooks, &c.—	
See Wrought Goods.	

Miscellaneous—	
Hooks, Bench, see Stops, Bench.	
Bush, Light, doz. \$1.75; Medium, \$5.35; Heavy, \$6.25	
Grass, beat, all sizes, per doz. \$1.50	
Grass, common grades, all sizes, per doz. \$1.30	
Whistle.....	1b. 5¢
Hooks and Eyes.....	60¢
Brass.....	60¢
Malleable Iron.....	70¢
Covert Mfg. Co. Gate and Scuttle Hooks.....	35¢
Covert Saddlery Works' Self Locking Gate and Door Hook.....	60¢
Ft. Madison Cut-Easy Corn Hooks.....	35¢
Bench Hooks—See Bench Stops.	
Corn Hooks—See Knives, Corn.	

Horse Nails—	
See Nails, Horse.	

Horseshoes—	
See Shoes, Horse.	

Hose, Rubber— Garden Hose, 1/2-inch:

Competition.....	ft. 5 @ 6¢
3-ply Standard.....	ft. 8 @ 9¢
4-ply Standard.....	ft. 10 @ 11¢
3-ply extra.....	ft. 11 @ 13¢
4-ply extra.....	ft. 14 @ 16¢
Cotton Garden, 3/4-in., coupled:	
Low Grade.....	ft. 8 @ 9¢
Fair Quality.....	ft. 10 @ 11¢

Irons— Sad—

From 4 to 10.....	lb. 2¢
B. B. Sad Irons.....	lb. 3½¢
Chinese Laundry.....	lb. 4½¢
Chinese Sad.....	lb. 4½¢
Mrs. Potts', cents per set:	
Nos.....	50 55 60 65
Jap'd Tops.....	63 59 72 69
Tin'd Tops.....	65 62 75 72
New England Pressing.....	lb. 3½¢

Pinking—

Pinking Irons.....	doz. 6 @ 60¢
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Soldering—

Soldering Coppers, 2 1/2 & 3.20 @ 21¢	
1 1/2 & 2.....	22¢ @ 23¢

Jacks, Wagon—

Covert Mfg. Co.:	
Auto Screw.....	30¢
Steel.....	45¢
Covert's Saddlery Works:	
Daisy.....	60¢
Victor.....	60¢
Lockport.....	60¢
Lane's Steel.....	60¢
Richards' Tiger Steel, No. 130.....	40¢

Kettles—

Brass, Spun, Plain.....	20¢ @ 25¢
Enamelled and Cast Iron—See Ware, Hollow.	

Knives—

Butcher, Kitchen, &c.—	
Foster Bros' Butcher, &c.....	30¢
Smith & Hemenway Co.....	40¢
Wilkinson Shear & Cutlery Co.....	50¢

Corn—

Withington Acme.....	doz. 66¢
Dent, \$2.75; Adj. Serrated.....	\$2.20
Serrated, \$2.10; Yankee No. 1, \$1.50;	
Yankee No. 2, \$1.15.	

Drawing—

Standard List.....	75¢
C. E. Jennings & Co., Nos. 45, 46, 60;	
Jennings & Griffin, Nos. 41, 42.....	60¢
Iron Tool Co.'s.....	70¢
Swan's.....	70¢
Vatrous.....	70¢
L. & W. White.....	70¢

Hay and Straw—

Serrated Edge, per doz. \$5.25 @ 5.50	
Iwan's Sickle Edge.....	30¢
Iwan's Serrated.....	30¢

Mincing—

Buffalo.....	1/2 doz. \$13.00
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Miscellaneous—

Farriers'.....	doz. \$3.00 @ 3.25
Westenholm's.....	doz. \$3.00 @ 3.25

Knobs—

Base, 2 1/2-inch, Birch, or Maple,	
Rubber tip.....	gro. \$1.15 @ 1.20
Carriage, &c., all sizes.....	
Door, Mineral.....	doz. 65¢ @ 70¢
Door, Por. Jap'd.....	doz. 70¢ @ 75¢
Door, Por. Nickel.....	doz. 70¢ @ 75¢
Bardsley's Wood Door, Shutters, &c. 15¢	
Picture, Sargent's.....	60¢ @ 10¢

Lacing, Leather—

See Belting, Leather.	
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Ladders, Store, &c.—

Lane's Store.....	25¢
Myers' Noiseless Store Ladders.....	50¢
Richards Mfg. Co.:	
Improved Noiseless, No. 112.....	40¢
Climax Shelf, No. 113.....	40¢
Trolley, No. 119.....	40¢

Ladies, Melting—

L. & G. Mfg. Co. (low list).....	25¢
P. S. & W.....	60¢
Reading.....	60¢
Sargent's.....	50¢

Lanterns—Tubular—

Regular Tubular, No. 0.....	doz. \$1.25 @ 1.35
Lift Tubular, No. 0.....	doz. \$1.50 @ 1.55
Hinge Tubular, No. 0.....	doz. \$1.50 @ 1.55
Other Styles.....	40¢ @ 10¢

Bull's Eye Police—

No. 1, 2 1/2-inch.....	\$2.50 @ 2.75
No. 2, 3-inch.....	\$2.75 @ 3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....	50¢
Stowell's Badger, Cast Iron.....	50¢

Latches—Thumb—

Roggin's Latches, with screw.....	doz. 35¢ @ 40¢
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Door—

Cronk & Carrier Mfg. Co., No. 101.....	1/2 doz. \$2.00
Cronk & Carrier Mfg. Co., Latch, Haap and Staples.....	50¢
Richards' Bull Dog, Heavy No. 125.....	40¢
Richards' Trump, No. 127.....	50¢

Leaders, Cattle—

Small.....	doz. 50¢
Covert Mfg. Co., Cotton and Hemp.....	45¢

Lifters, Transom—

R. & E.....	33¢
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Lines—

Wire Clothes, Nos. 13 19 30	
100 feet.....	\$2.20 2.00 1.70
75 feet.....	\$1.80 1.70 1.50
Samson Cordage Works:	
Solid Braided Chalk, Nos. 0 to 3.....	40¢
Silver Lake Braided Chalk, No. 0.....	30¢
No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50.	
Mason's Lines, Shade Cord, &c.....	20¢
White Cotton, No. 3 1/2, \$1.30; No. 4.....	

\$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2, \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75;	
Linen, No. 3 1/2, \$2.50; No. 4, \$3.00;	
No. 4 1/2, \$4.50.	
Tent and Awning Lines: No. 5, \$8.50; White Cotton, \$7.50; Drab Cotton, \$8.50.	
Clothes Lines, White Cotton: 50 ft., \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75;	
100 ft., \$5.25.	
Ammonite Waterproof Clothes, 50 ft., \$3.00; \$24.00; Gilt Edge, \$22.00; Air Line, \$22.00; Acme, \$17.00; Alabama, \$15.00; Empire, \$14.00; Advance, \$13.50; Oriole, \$30.00; Albemarle, \$13.50; Eclipse, \$12.50; Chicago, \$11.00; Standard, \$10.00; Columbia, \$8.50; Allston, \$12.50; Calhoun, \$11.00.	

Locks— Cabinet—

Cabinet Locks.....	33 1/2¢ @ 33 1/2¢ @ 7 1/2¢
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Door Locks, Latches, &c.—

NOTE—Net Prices are very often made on these goods.	
Reading Hardware Co.....	40¢
R. & E. Mfg. Co.....	40¢
Sargent & Co. Venting.....	40¢
Stowell's Steel Door Latches.....	50¢

Elevator—

Stowell's.....	30¢
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Padlocks—

Wrought Iron.....	75¢ @ 10¢ @ 80¢ @ 85¢
R. & E. Mfg. Co. Wrought Steel and Brass.....	75¢ @ 75¢ @ 10¢

Sash, &c.—

Ives' Patent:	
Bronze and Brass.....	62 1/2¢
Crescent.....	50¢ @ 10¢
Iron.....	62 1/2¢
Window Ventilating.....	60¢
Robison Patent Ventilating.....	40¢
Lock.....	40¢
Wrought Bronze and Brass.....	55¢
Wrought Steel.....	55¢
Pullman Patent Ventilating Lock.....	25¢
Reading.....	40¢

Machines—Boring—

Com. Up'r, without Augers.....	\$2.00
Com. Ang'r, without Augers.....	\$2.25
Without Augers.....	
R. & E. Mfg. Co.:	
Improved No. 3, \$4.25; No. 1, \$5.00;	
Improved No. 4, \$4.75; No. 2, \$3.38;	
Improved No. 5, 2.75	
Jennings', Nos. 1 and 4.....	35¢ @ 5¢
Miller's Falls.....	6.75
Snell's, Rice's Pat. 2.50	2.75

Corking—

Reisinger Invinible Hand Power.....	1/2 doz. \$48.00
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Fence—

Williams' Fence Machines.....	each, \$5.50
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Hoisting—

Moore's Anti-Friction Differential Pulley Block.....	30¢
Moore's Hand Hoist, with Lock Brake.....	20¢

Ice Cutting—

Chandler's.....	12 1/2¢
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Washing—

Boss Washing Machine Co.:	
Boss No. 1.....	\$57.00
Boss Rotary.....	\$54.00
Champion Rotary Banner No. 1.....	\$54.00
Standard Champion No. 1.....	\$48.00
Standard Perfection.....	\$26.00
Cinti Square Western.....	\$30.00
Unedea American, Round.....	\$30.00

Mallets—

Hickory.....	45¢ @ 50¢
Lignumvita.....	45¢ @ 50¢
Tinnars' Hickory and Applewood.....	doz. 45¢ @ 50¢

Mangers, Stable—

Sweet Iron Works.....	50¢
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Mashers, Vegetable—

Western W. G. Co., Potato.....	60¢ @ 10¢
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Mats, Door—

Elastic Steel (W. G. Co.).....	10¢
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Mattocks—

See Picks and Mattocks.	
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Milk Cans—See Cans, Milk.

Mills, Coffee, &c.—

Enterprise Mfg. Co.....	25¢ @ 30¢
National Jan. 1, 1902.....	50¢
Parker, Columbia & Victoria.....	50¢ @ 60¢
Parker's Box and Slide.....	50¢ @ 60¢
Swift, Lane Bros. Co.....	30¢

Mowers, Lawn—

NOTE—Net prices are generally quoted	
Cheapest.....	all sizes, \$1.85 @ 2.00
Cheap.....	all sizes, \$2.00 @ 2.50
Better Grade.....	all sizes, \$2.50 @ 4.50
12 14 16	

Thread No. 2, 1/4-in. & up, 16.5¢
Old Colony Manila Transmission
Rope 17 1/2¢

Wire Rope—

Galvanized 12 1/2¢
Plain 10 1/2¢

Ropes, Hammocks—

Covert Mfg. Co.:
Jute 50¢
Sisal 30¢
Covert Saddlery Works 60¢

Rulers, Desk—

Stimpson & Son:
Boxwood and Maple 30¢

Rules—

Boxwood 60¢
Ivory 35¢
Chapin-Stephens Co.:
Boxwood 60¢
Flexiford 27¢
Ivory 35¢
Miscellaneous 50¢
Combination 55¢
Stationers 10¢

Keuffel & Esser Co.:
Folding, Wood 35¢
Folding, Steel 33¢
Lufkin's Steel 50¢
Lufkin's Lumber 60¢
Stanley R. & L. Co.:
Boxwood 62¢
Ivory 40¢
Miscellaneous 40¢
Zig Zag 42¢
Zig Zag, Pin Joint 42¢
Upon Nut Co.:
Boxwood 60¢
Ivory 35¢

Sash Balances—

See Balance, Sash.

Sash Locks—

See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.**Saw Tools—See Tools, Saw.****Saws—**

Atkins:
Circular 50¢
Band 50¢
Cross Cuts 35¢
Muley, Mill and Drag 50¢
One-Man Saw 40¢
Wood Saws 40¢
Hand, Compass, &c. 40¢
Chapin-Stephens Co.:
Turning Saws and Frames 30¢
Diamond Saw & Stamping Works 30¢
Sterling Kitchen Saws 30¢
Circular, Solid and Ins'ted Tooth 50¢
Band, 2 to 14 in. wide 60¢
Band, 1/4 to 1 1/2 in. 60¢
Crosscuts 50¢
Narrow Crosscuts 50¢
Muley, Mill and Drag 50¢
Framed Woodsaws 30¢
Woodsaw Blades 30¢
Woodsaw Rods 20¢
Hand Saws, Nos. 12, 9, 9, 16, 100 20¢
18, 12, 7, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100 20¢
0, 00, Combination 30¢
Compass, Key Hole, &c. 25¢
Butcher Saws and Blades 30¢
C. E. Jennings & Co.:
Back Saws 30¢
Butcher Saws 30¢
Compass and Key Hole Saws 35¢
Framed Wood Saws 30¢
Hand Saws 20¢
Woodsaw Blades 30¢
Millers Falls:
Butcher Saws 15¢
Star Saw Blades 15¢
Peace & Richardson's Hand Saws 30¢
Simonds:
Circular Saws 50¢
Crescent Ground Cross Cut Saws 30¢
One-Man Cross Cut Saws 30¢
Gang Mill, Muley and Drag Saws 50¢
Band Saws 50¢
Back Saws 25¢
Butcher Saws 30¢
Hand Saws 25¢
Compass, Key Hole, &c. 25¢
Wood Saws 30¢
Springfield Mach. Screw Co.:
Diamond Kitchen Saws 40¢
Butcher Saws 30¢
Wheeler, Madden & Clemon Mfg. Co.'s Cross Cut Saws 30¢

Hack Saws—

Atkins' Hack Saw Blades A & A 25¢
Diston's:
Concave Blades 25¢
Keystone 40¢
Hack Saw Frames 30¢
Fitchburg File Works, The Best 25¢
C. E. Jennings & Co.:
Hack Saw Frames, Nos. 175, 180, 40¢
Hack Saws, Nos. 175, 180, complete 40¢
Goodell's Hack Saw Blades 40¢
Griffin's Hack Saw Blades 35¢
Griffin's Hack Saw Blades 35¢
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades 35¢
Diamond Hack Saw Frames 50¢
Star Hack Saws and Blades 15¢
Sterling Hack Saw Blades 30¢
Sterling Hack Saw Frames 30¢

Scroll—

Barnes' No. 7 15¢
Barnes' Scroll Saw Blade 40¢
Barnes' Velocipede Power Scroll Saw without boring attachment, \$18 with boring attachment, \$20
Lester, complete, \$10.00
Rogers, complete, \$10.00
Scalers, Fish—
Covert's Saddlery Works 60¢

Scales—

Family, Turnbul's 50¢

Counter:

Hatch, Platform, 1/2 oz. to 4 lbs. doz. \$5.50
Two Platforms, 1/2 oz. to 8 lbs. doz. \$16.00
Union Platform, Plain \$1.70
Union Platform, Stpd. \$1.85
Chattillon's:
Eureka 25¢
Favorite 40¢
Crocers' Trip Scales 50¢
Chicago Scale Co.:
The "Little Detective" 25 lbs 50¢
Union or Family No. 2 50¢
Portable Platform (reduced list) 50¢
Wagon or Stock (reduced list) 35¢
"The Standard" Portables 50¢
"The Standard" R. K. and Wagon 50¢

Scrapers—

Box, 1 Handle doz. \$2.00
Box, 2 Handle doz. \$2.60
Shoe, Light \$2.00; Heavy \$1.50
Adjustable Box Scraper (S. B. & L. Co.), \$6.00
Chapin-Stephens Co., Box 30¢

Screens, Window and Frames—

Air Line Pattern Screens 60¢
Flyer Pattern Screens 60¢
Maine Screen Frames 40¢
Perfection Screens 60¢
Phillips' Screen Frames 60¢
See also Doors.

Screws—Bench and Hand

Bench, Iron, doz. 1 in. \$2.50
2 1/2; 1 1/2, \$3.00
Bench, W'd. Beech, doz. 30¢
Hand, Wood 30¢
R. Bliss Mfg. Co., Hand 30¢
Chapin-Stephens Co., Hand 30¢
Ohio Tool Co., Bench and Hand 30¢
Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 75¢
Coach, Gimlet Point, list Oct. 1, '99 75¢
Hand Rail, list Jan. 1, '81 70¢

Jack Screws—

Standard List 75¢
Millers Falls 50¢
Millers Falls, Roller 50¢
P. S. & W. 50¢
Sargent 70¢
Swett Iron Works 75¢

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron 50¢
Flat or Round Head, Brass 50¢

Set and Cap—

Set (Iron) 80¢
Set (Steel), net advance over Iron 25¢
Sq. Hd. Cap. 75¢
Hex. Hd. Cap. 75¢
Rd. Hd. Cap. 60¢
Fillister Hd. Cap. 60¢

Wood—

List July 23, 1903:
Flat Head, Iron 87¢
Round Head, Iron 85¢
Flat Head, Brass 85¢
Round Head, Brass 80¢
Flat Head, Bronze 77¢
Round Head, Bronze 75¢
Drive Screws 87¢

Scroll Saws—

See Saws, Scroll.

Scythes—

Prices announced for next season:
Clipper Pattern, Grass 60¢
Full Polished, Clipper 65¢
Grain 80¢
Clipper, Grain 85¢
Weed and Bush 85¢

Seeders, Raisin—

Enterprise 25¢

Sets—Awl and Tool—

Alken's Sets, Awl and Tools:
No. 20, doz. \$10.00
Fray's Adj. Tool Handles, Nos. 1, 1 1/2, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 50¢
C. E. Jennings & Co.'s Model Tool Holders 30¢
Millers Falls Adj. Tool Handles, No. 1, 1 1/2, No. 4, 1 1/2, No. 5, 1 1/2, No. 15, 1 1/2, No. 16, 1 1/2, No. 17, 1 1/2, No. 18, 1 1/2, No. 19, 1 1/2, No. 20, 1 1/2, No. 21, 1 1/2, No. 22, 1 1/2, No. 23, 1 1/2, No. 24, 1 1/2, No. 25, 1 1/2, No. 26, 1 1/2, No. 27, 1 1/2, No. 28, 1 1/2, No. 29, 1 1/2, No. 30, 1 1/2, No. 31, 1 1/2, No. 32, 1 1/2, No. 33, 1 1/2, No. 34, 1 1/2, No. 35, 1 1/2, No. 36, 1 1/2, No. 37, 1 1/2, No. 38, 1 1/2, No. 39, 1 1/2, No. 40, 1 1/2, No. 41, 1 1/2, No. 42, 1 1/2, No. 43, 1 1/2, No. 44, 1 1/2, No. 45, 1 1/2, No. 46, 1 1/2, No. 47, 1 1/2, No. 48, 1 1/2, No. 49, 1 1/2, No. 50, 1 1/2, No. 51, 1 1/2, No. 52, 1 1/2, No. 53, 1 1/2, No. 54, 1 1/2, No. 55, 1 1/2, No. 56, 1 1/2, No. 57, 1 1/2, No. 58, 1 1/2, No. 59, 1 1/2, No. 60, 1 1/2, No. 61, 1 1/2, No. 62, 1 1/2, No. 63, 1 1/2, No. 64, 1 1/2, No. 65, 1 1/2, No. 66, 1 1/2, No. 67, 1 1/2, No. 68, 1 1/2, No. 69, 1 1/2, No. 70, 1 1/2, No. 71, 1 1/2, No. 72, 1 1/2, No. 73, 1 1/2, No. 74, 1 1/2, No. 75, 1 1/2, No. 76, 1 1/2, No. 77, 1 1/2, No. 78, 1 1/2, No. 79, 1 1/2, No. 80, 1 1/2, No. 81, 1 1/2, No. 82, 1 1/2, No. 83, 1 1/2, No. 84, 1 1/2, No. 85, 1 1/2, No. 86, 1 1/2, No. 87, 1 1/2, No. 88, 1 1/2, No. 89, 1 1/2, No. 90, 1 1/2, No. 91, 1 1/2, No. 92, 1 1/2, No. 93, 1 1/2, No. 94, 1 1/2, No. 95, 1 1/2, No. 96, 1 1/2, No. 97, 1 1/2, No. 98, 1 1/2, No. 99, 1 1/2, No. 100, 1 1/2

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel 50¢

Sets, Nails—

Octagon 30¢
Buck Bros. 25¢
Cannon's Diamond Point 12¢
Mayhew's 30¢
Snell's Cannon's Diamond Point 30¢
Snell's Cor'gated, Cup Pt. 30¢
Snell's Knurled, Cup Pt. 30¢
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. 30¢

Rivet—

Regular list 75¢

Saw—

Aiken's:
Genuine 50¢
Imitation 50¢
Atkin's:
Criterion 40¢
Adjustable 40¢
Bemis & Call Co.'s:
Plate 20¢
Diston's Star and Monarch 25¢
Morrill's No. 1 15¢
Nos. 3 and 4, Cross Cut 20¢
No. 5, Mill 30¢
No. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 50¢
Special 16¢
Giant Royal Cross Cut 30¢
Royal Hand 30¢
Taintor Positive 30¢

Shaving—

Fox Shaving Sets, No. 30 30¢
doz., net, \$24.00

Sharpeners, Knife—

Chicago Wheel & Mfg. Co. 70¢

Shaves, Spoke—

Iron 10¢
Wood 10¢
Bailey's (Stanley R. & L. Co.) 15¢
Razor Edge (Stanley R. & L. Co.) 35¢
Chapin-Stephens Co. 30¢
Goodell's 30¢
Wood's Ft and F2 50¢

Shears—

Cast Iron 7 8 9 in.
Best \$16.00 18.00 20.00 gro.
Good \$13.00 15.00 17.00 gro.
Cheap \$5.00 6.00 7.00 gro.

Straight Trimmers, &c.—

Best quality Jap. 70¢
Best quality, Nickel 60¢
Fair quality, Jap. 80¢
Fair quality, Nickel 75¢
Tailors' Shears 40¢
Acme Cast Shears 40¢
Heinisch's Tailor's Shears 10¢
Wilkinson's Hedge, 1900 list 40¢
Wilkinson's Branch, Lawn & Border 40¢
Wilkinson's Sheep, 1900 list 50¢

Tinners' Snips—

Steel Blades 20¢
Steel Laid Blades 40¢
Forged Handles, Steel Blades, Berlin 40¢
Heinisch's Snips 40¢
Jennings & Griffin Mfg. Co.'s 6 1/2 to 10 in. 50¢
Niagara Snips 40¢
P. S. & W. Co. 20¢

Pruning Shears—

Cronk's Hand Shears 33¢
Cronk's Wood Handle Shears 33¢
Disston's Combined Pruning Hook and Saw 35¢
Disston's Pruning Hook 25¢
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40¢
Orange Shears 50¢
Tree Pruners 75¢
P. S. & W. Co. 33¢

Sheaves—Sliding Door—

Stowell's Anti-Friction 50¢
Patent Roller, Hatfield's, Sargent's list 70¢
Reading 40¢
R. & E. list 33¢
Wrightsville Hatfield Pattern 80¢

Sliding Shutter—

Reading list 40¢
R. & E. list 33¢
Sargent's list 50¢

Shells—Shells, Empty—

Brass Shells, Empty:
First quality, all gauges 60¢
Climax, Club, Rival, 10 and 12 gauge 65¢
Paper Shell Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge 25¢
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20¢
Climax, Union, League, New Rival, 14, 16 and 20 gauge (\$7.50 list) 20¢
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge 30¢
Robin Hood, Low Brass 20¢
Robin Hood, High Brass 30¢

Shells, Loaded—

Loaded with Black Powder 40¢
Loaded with Smokeless Powder, medium grade 40¢
Loaded with Smokeless Powder, high grade 40¢
Robin Hood Smokeless Powder 50¢
Comets, High Brass 30¢

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron per keg \$4.00
Steel per keg \$3.75
Burdens, all sizes 30¢

Shot—

Drop, up to B, 25-lb. bag 1.65
Drop, B and larger per 25-lb. bag 1.90
Buck, 25-lb. bag 1.90
Chilled, 25-lb. bag 1.90

Shovels and Spades—

Association List, Nov. 15, 1902 40¢

Sieves and Sifters—

Hunter's Imitation 100¢

Hunter's Genuine 120¢

Buffalo Metallic Blued, S. S. Co. 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 1.30

Shaker (Barley's Pat.) Flour Sifter 1.40

doz. \$2.00

Sieves, Seamless Metallic

Mesh 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 in.

Mesh 18, Nested 1.00

Mesh 20, Nested 1.00

Mesh 24, Nested 1.00

Sinks, Cast Iron—

Standard list 60¢

Barnes' low list 60¢

NOTE—There is not entire uniformity in lists used by jobbers.

Skins, Wagon—

Cast Iron 80¢

Steel 40¢

Slates, School—

Factory Shipments.

"D" Slates 50¢

Eureka, Unexcelled Noiseless 60¢

Victor A, Noiseless 60¢

Slaw Cutters—See Cutters.

Snaps, Harness—

German 40¢

Covert Mfg. Co. 30¢

High Grade 35¢

Jockey 35¢

Trojan 35¢

Yankee 35¢

Yankee Roller 35¢

Covert's Saddlery Works:

Crown 60¢

German 60¢

Model 60¢

Triumph 60¢

Oneida Community 60¢

Solid Swivel 60¢

Sargent's Patent Guarded 60¢

Snaths—

Scythe 50¢

Snips, Tinner's—See Shears.

Spoons and Forks—

Silver Plated—

Good Quality 50¢

Cheap 60¢

International Silver Co.:

1847 Rogers Bros. and Rogers 40¢

Hamilton 40¢

Rogers & Bro., William Rogers 50¢

Eagle Brand 50¢

Anchor, Rogers Brand 50¢

Wm. Rogers & Son 60¢

Miscellaneous—

German Silver 60¢

Cattaraugus Cutlery Co. 50¢

Seneca Silver 50¢

Tinned Iron—

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